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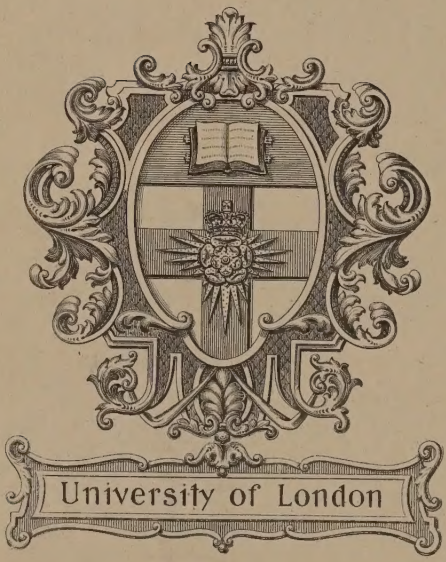
University of London

REPORTS

FROM

COMMISSIONERS:

SEVENTEEN VOLUMES.

—(15.)—

CUSTOMS; INLAND REVENUE; POST OFFICE; PUBLIC RECORDS; SEWAGE OF TOWNS.

Session

7 February —— *6 July* 1865.

VOL. XXVII.

REPORTS

FROM

COMMISSIONERS:

WITH MINUTES OF EVIDENCE.

—(12.)—

INLAND REVENUE, POST OFFICE,
PUBLIC RECORDS: SEWAGE OF TOWNS.

Session

1 February — 6 July 1863.

VOL. XXVII.

REPORTS FROM COMMISSIONERS:

1865.

SEVENTEEN VOLUMES:—CONTENTS OF THE

FIFTEENTH VOLUME.

N. B.—*THE* Figures *at the* beginning of the line, *correspond with the* N° *at the of each* Report; *and the* Figures *at the* end of the line, *refer to the* MS. Paging *the Volumes arranged for The House of Commons.*

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1853.

NINTH REPORT

OF

...CLUB
...MALL

THE COMMISSIONERS OF HER MAJESTY'S CUSTOMS

ON

THE CUSTOMS.

Presented to both Houses of Parliament by Command of Her Majesty.

LONDON:
PRINTED BY GEORGE E. EYRE AND WILLIAM SPOTTISWOODE,
PRINTERS TO THE QUEEN'S MOST EXCELLENT MAJESTY.
FOR HER MAJESTY'S STATIONERY OFFICE.

12551. 1865.

3543

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NINTH REPORT.

TO THE RIGHT HONOURABLE THE LORDS COMMISSIONERS OF HER MAJESTY'S TREASURY.

My Lords,

The tranquil position of this country during the year 1864, both as regards her foreign and domestic relations, the gradual diminution of distress in the manufacturing districts in consequence of the more plentiful supply of cotton, and the recurrence of a harvest surpassing in abundance even that of 1863, have all contributed to enable us again to present to your Lordships very satisfactory returns of trade, both as regards exports, imports, and consumption. State of the country in 1864.

It was not indeed to be expected, after the vast advance made in 1863 in the extent of the commercial transactions of the country, (an advance that appeared the more remarkable as following closely upon two years of comparative depression as far as the export trade was concerned,) that the increase shown in the values of the British and Irish exports of 1864 over those of 1863 should exceed or even equal that which we presented to your Lordships on a comparison of 1863 with 1862. It is, however, still very considerable, and if the year 1862 be admitted to the comparison, the aggregate increase on the two years is larger than any we have previously recorded. The figures are as follows: Exports, British and Irish.

British and Irish exports, value—

	£
1862 - - -	123,992,264
1863 - - -	146,602,342
1864 - - -	160,436,302

Appendix A.

showing a rise of nearly 14 millions, or 9 per cent. in 1864 over 1863, as compared with one of 23 millions or 18 per cent. in 1863 over 1862, and an aggregate increase in 1864 over 1862 of 36½ millions, or 29 per cent.

If we select a few articles from the long array of British and Irish manufactures yearly exported, we find that the largest addition has been to the values of cotton manufac-

tures, which show an increase of six millions. This does not, however, represent quite a corresponding advance in the quantities exported, the variation in the price of cotton piece goods during the last two years having been about 14 per cent. in favour of the prices of 1864.

There is also a rise in the values of—

	£
Woollen and worsted manufactures of	3,000,000
Linen manufacture - - „	1,500,000
Machinery - - - „	500,000
Hardware and Cutlery - - „	300,000
And haberdashery - - „	400,000

The values of manufactures of iron and unwrought steel remain almost stationary.

To foreign countries.

Dividing the exports between those to foreign countries and to British possessions, we find the return of the former shows an increase of 13 millions, nearly the same that took place in 1863, the figures being as follows :—

	£
1862 - - -	82,096,915
1863 - - -	95,723,072
1864 - - -	108,752,872

With the exception of France, all our more important foreign customers have made larger demands upon us than they did in 1863. There is an increase in the value of the exports to the United States of more than one million, to the Hanse Towns of 2,500,000*l.*, to Brazil of 2,300,000*l.*, and to Egypt of 1,600,000*l.* The exports to Turkey, Holland, Russia, Belgium, Denmark, and China, also show a considerable augmentation, while to Portugal, Spain, Italy, and Prussia, as to France, they have somewhat fallen off.

Appendix O., No. I.
Appendix Q., No. 1.

We give, as we did last year, in separate tables, a comparison of the British and Irish exports to America and France for the last five years.

To America.

The largest increase in the exports to America in 1864 over 1863 appears to be in linen piece goods, in iron manufactures (especially in that class called railway iron), and in lead; while the demand for arms, ammunition, and military stores (including gunpowder), on the vast increase of which we remarked in our report for the year 1862, has now greatly declined, the values having fallen from upwards of 400,000*l.* in 1863, and upwards of a million

in 1862, to 39,000*l.*, a point below even the ordinary demand before the war commenced in 1860.

In the return for France, which shows the values of our exports to that country to have been 8,200,760*l.* in 1864 as against 8,673,309*l.* in 1863, we find a fulfilment of the anticipations we expressed last year, viz., that there would be no further immediate extension of our export trade to that country. The whole net decrease is indeed not quite so large as the one upon which we commented in our last report, the amount being 472,549*l.* against 536,058*l.* The articles showing the largest falling off are metals, copper and iron wrought and unwrought, worsted stuffs, haberdashery, wheat, and linen yarn. It may be interesting to some readers to know that the value of horses exported to France in 1863 was estimated at 77,197*l.*, and that it has declined in 1864 to 55,543*l.* To France.

Notwithstanding, however, this falling off of a million on the exports generally to France in two years, it will be seen that there still remains the highly satisfactory increase of nearly 3 millions over the exports of 1860, as one of the results of the commercial treaty.

Turning to the British and Irish exports to our colonies, we find the figures to be as follows :— To British Possessions.

	£
1863 - - - -	50,879,270
1864 - - - -	51,683,430

showing this year but a very small increase, amounting only to 1½ per cent., or less than one million, a fact only to be attributed to the large rise of nine millions or 21 per cent. in 1863 as compared with 1862, as recorded in our report of last year. The value of the supplies sent to India has not quite reached the 20 millions she received from us in 1863. Those to Australia have also slightly fallen off, while there is an increased demand from British North America and the West India Islands.

The foreign and colonial exports in like manner show an increase of not quite two millions as against one of eight millions in round numbers in 1863 and 1862 respectively. The figures are,— Foreign and Colonial. Appendix A.

	£
1861 - - -	34,529,684
1862 - - -	42,175,870
1863 - - -	50,300,067
1864 - - -	52,240,240

There appears to have been re-exported in round numbers :—

	Computed real Value. £
Cotton, raw, to the value of	20,880,312
Coffee, to the value of	2,590,427
Silk, raw „	4,396,054
Tea „	2,094,594
Tobacco „	851,185
Wine „	675,989
Spirits, Rum, Brandy, and Geneva, to the value of	420,328
Wool „	4,370,737

The quantities of coffee, tea, and tobacco re-exported represented by these values have considerably increased, as compared with 1863, while the quantities of wool have fallen off to the amount of 8,000,000 lbs. in round numbers.

Appendix R. No. 1 and No. 2.

To America and France we re-exported foreign produce of the value of,

£ £

3,298,398 and 15,956,692 respectively,

as against 4,352,393 and 14,621,257 in 1863.

The value of the cotton raw re-exported to America was 1,171,048*l.* as against 1,391,749*l.* in 1863 (out of which 603,951*l.* was the value of their own cotton returned to them), and to France 5,240,421*l.* as against 5,317,543*l.*, and these figures represent a still further diminution in cwts., the average price of cotton from Egypt and the United States having been higher in 1864 than in 1863 by about 4½*d.* per lb., and that from Brazil by about 5½*d.* per lb.

Imports. Values.

The real values of the imports are increasing at a rate that appears almost incredible. In 1863 there was a rise of 23 millions over 1862, and in 1864 again there is an increase of nearly 26 millions over 1863. Since 1859, that is in five years, goods of the value of nearly 100 millions have been added to the annual amount of our importations, or at the mean rate of 20 millions additional for each successive year, and if the proportion arrived at in the last two years be maintained, it will hardly take four years from 1863 to arrive at the same result.

The return for 10 years will be found in Appendix A., but we give the last six years here for the sake of easier reference. Appendix A.

	£
1859 - - -	179,182,355
1860 - - -	210,530,873
1861 - - -	217,485,024
1862 - - -	225,716,976
1863 - - -	248,919,020
1864 - -	**274,863,924**

This increase of 26 millions is divided between the foreign and the colonial importer in the ratio of 17 millions to 9. The return from the former being,—

181,137,158 - - in 1864
against 164,235,273 - - in 1863

and from the latter

93,726,766 - - in 1864
against 84,683,747 - - in 1863

From foreign countries.

Of Foreign Countries the largest increases are in the arrivals from Egypt and Holland. In the former case from 16 to 19 millions, and in the latter from 8 to 11 millions; the cause, in the case of Egypt, being the rapid and successful adaptation of a very extended area for the cultivation of cotton in that country (the produce of that article alone absorbing 14 out of the 19 millions above stated); and in the latter the great impetus given by the late alteration of the sugar duties to the importation of Dutch refined sugar.

Russia has also sent us more of her goods to the amount of two millions, and the Foreign West Indies to the same amount, while the Hanse Towns, Belgium, Spain, and Mexico have each added a million to the former value of their importations. There is a slight increase in the supplies from Norway, Denmark, and Japan, and a trifling falling off in those from Portugal, Italy, and China.

The values of the imports from America and France are separately given in Appendices O., No. 2, and Q., No. 2. Those from America have experienced a still further diminution (as was to be expected from the continuance of the war and the consequent declining condition of trade,) of more than one million and a half beyond the great decrease that we recorded in 1863, as compared with 1862. This has extended to Northern, Southern, and Pacific ports alike, and the totals are represented by the following figures:—

1862.	1863.	1864.
£27,715,118	£19,572,010	£17,923,577

Those from France have again increased, and in nearly the same proportion as in 1863, the figures being (exclusive of corn and flour),—

Appendix Q. No. 2.

1862.	1863.	1864.
£19,924,736	£21,910,274	£23,763,021

Or including those articles,

£21,675,516	£24,025,717	£25,640,551

The largest increases are in butter, cotton raw (which we shall further allude to), gloves of leather, clover seed, silk manufactures, brandy, and refined sugar. The only decrease of any note is in raw silk, and that only if compared with 1863, the values being still far above those attained in 1862 and 1861.

From British possessions.

Of the imports from our Colonial Dependencies, India continues to contribute more than half, and though the addition she has made this year to her general supply is not quite four millions in value instead of 14, as appeared in 1863, when compared with 1862, the whole of that increase represents a *bonâ fide* addition to the quantities of cotton imported, the prices of that article having ranged as nearly as possible 10*s.* per cwt., or about 1*d.* per lb. lower in 1864 than in 1863. We shall refer again to this subject in a later page of this report.

Australia has sent us more goods, to the amount of three millions, chiefly in the values of wool. Hong Kong and the Bermudas have more than doubled their supply. The Bahamas, whose imports and exports rose so suddenly in 1863 (as commented upon in our last report), owing to the establishment of Nassau as the depôt for the blockade runners both to and from the Southern States of America, have again added 900,000*l.* to their values. The other West India Islands, Singapore, British Guiana, and the Honduras, all also show an increase; while from Ceylon and British North America there is a decided falling off.

Quantities.

The returns which give the quantities of the principal articles imported show a decrease upon rather more articles than usual. Out of the 14 that we have usually selected there is in 1864, as compared with 1863, an increase on nine and a falling off on five.

Increase.

The nine showing an increase are—

Cotton, an increase of	-	33 per cent.
Flax „	-	26 „

Hemp and Jute, an increase of		33	per cent.
Spirits	„	1	„
Sugar (unrefined)	hardly	1	„
Timber and Wood	„	$2\frac{1}{2}$	„
Tobacco	„	20	„
Wine	„	9	„
and			
Wool	„	17	„

Those on the other hand showing a decrease are—coffee, tea, silk, corn and flour, and provisions.

We have a few remarks to make upon several of these articles.

1. Cotton shows an import of 7,975,935 cwts. against 5,978,422 in 1863, and 4,678,333 in 1862, an increase of 1,997,513, or very nearly two million cwts., over 1863.

On comparing the special return for cotton with the corresponding one given last year, we find an increase in the imports of cotton, in round numbers, from— Appendix H.

British India and Hong Kong of	823,000	cwts.
China	315,000	„
Egypt	285,000	„
Brazil	137,000	„
Bahamas and Bermuda (mostly American)	110,000	„
Turkey	59,000	„
Mexico	56,000	„
United States	69,000	„
And other countries collectively	143,000	„

Under this last denomination are found many countries where cotton is not grown, but where the temptation of high prices has induced the re-exportation of their stocks in hand to this country. Thus France has supplied us with cotton (partly grown in her possessions in Algeria and America) to an amount three times as large as that sent in the preceding year, viz., 46,000 cwts. in round numbers in 1864 as against 15,000 cwts. in 1863. The French possessions in India have also, though producing as yet but little, sent us more than four times as much as they did in 1863. The increase from China above mentioned amounts to 217 per cent. on the production of 1863, and that of Japan (from 6,000 to 83,000 cwts. in round numbers) to 1,200 per cent. Bremen, Denmark, Prussia, Canada (all contributing from the stock they have themselves imported), Belize, New Granada,

Venezuela, and the Foreign West India Islands, have considerably added to the quantities they have sent to this country; while the contributions from the British West India Islands, Italy, and the Cape of Good Hope have declined. Russia and Sweden have also been unable to spare us as much of their supply as they did in 1863; while Gibraltar, the Ionian Islands, Morocco, St. Helena, Chili, West and South Australia, appear for the first time in the return.

2. Flax gives 1,842,947 cwts. against 1,458,962 cwts.

3. Hemp and jute, 3,057,975 cwts. against 2,292,764 cwts.

4. Spirits. The quantities of spirits imported under the three heads of brandy, rum, and Geneva are as nearly as possible the same as in 1863, being 10,623,351 gallons against 10,520,679 gallons, an increase, as above stated, of not quite one per cent.

There is considerable variation, however, in the different sorts.

Rum, of which the quantity imported has for many years far exceeded that of other spirits, has, though still retaining that superiority, fallen lower than it has been since 1853, a period of eleven years, viz., from 7,194,738 gallons to 5,499,894 gallons, a decrease of 23 per cent.

This is accounted for partly by the large stocks of rum on hand at the close of 1863, and partly by brandy having become cheaper in the market. We understand also that the growing taste for the latter spirit will probably before long diminish the demand for rum, and that the imports of rum will not on that account show any sensible progress during the coming year.

Brandy, on the other hand, has, singularly enough, risen beyond the quantity shown in any return since the same year 1853, and, when compared with 1863, shows 4,907,770 gallons against 3,132,293, an increase of no less than 56 per cent. Geneva shows but little alteration.

5. Sugar (unrefined). The increase in the importation of this article is but small, the figures being—

1863	-	10,724,522 cwts.
1864	-	10,767,533 „
Increase	-	43,011 „

There is an increase in the 1st quality (equal to white clayed) of 168,000 cwts.; in the 2nd quality, of 500,000

cwts., but a decrease in the 3rd quality (divided by the Act of last year into 3rd and 4th qualities) of 623,000 cwts., in round numbers. We postpone remarking upon these points till we come to the home consumption returns. The importation of refined and sugar candy has received a great stimulus in anticipation and in consequence of the great reduction in the duty last year (from 16*s.* to 11*s.* 8*d.* per cwt.), and has risen from 297,589 cwts. to 945,663 cwts., an increase of 218 per cent. Appendix D.

6. Timber and wood goods give 3,528,659 loads against 3,437,879 loads.

7. Tobacco, 66,614,776 lbs. against
55,122,013 lbs. in 1863,
and 42,306,034 lbs. in 1862.

This is a large progressive increase, and is not found in the manufactured article only, and therefore not solely attributable to the reduction in the duty on that article in 1862. The principal rise is again, as last year, in the unstemmed leaf, viz., from 39 to 49 millions of lbs. From a return, which will be found in Appendix V., of the quantities of unmanufactured tobacco imported in each year from 1860 to 1864 inclusive, it will be seen— Appendix V.

1st. That in 1860, when the war broke out in America, a great stimulus was given to the growth of tobacco in other countries for the English market, which resulted in an importation in 1861 of more than double the amount previously received, viz., of 17 millions of lbs. instead of 8 millions in round numbers; 2ndly, that this increased supply has continued still further slowly to progress till 1864, when it reached 21 millions of lbs.; and, 3rdly, that the importations from America, which experienced a great decline in the first two years of the war, viz., from 40 millions of lbs. in 1860 to 21 millions of lbs. in 1862, have since that period been gradually recovering, till they have reached upwards of 39½ millions of lbs. in 1864, an amount but little short of the return for 1860.

8. Wine. Having entered rather fully into the case of the imports of wine in our last report, we need only say that they continue still steadily to increase. The quantities are 15,451,622 gallons as against 14,185,195 gallons in 1863.

There is a considerable increase in the wines from Spain and France, and a falling off in those from Portugal. Spain has indeed this year quite eclipsed her two great

rivals, having sent us more than double the quantity we have received from either Portugal or France, as the following figures show:—

	Gallons.
Spain, red - - -	709,854
„ white - - -	7,081,033
Total -	7,790,887
Portugal - - -	3,344,871
France, red - - -	1,781,611
„ white - - -	941,589
Total -	2,723,200

The red wines from France show a larger proportionate increase than the white, the figures being as follows:—

	1863.	1864.
Red - -	1,405,360	1,781,611 galls.
White - -	781,346	941,589 „

an increase of 26 per cent. in the red and 20 per cent. in the white.

The red wines from Spain, manufactured and imported for the sake of rivalling port wine in the market, have risen from 569,071 gallons in 1863 to 709,854 gallons, an increase of nearly 25 per cent. That this effort has been attended with considerable success we shall see when we come to our return for home consumption.

9. Of wool we have received 203,809,018 lbs. in 1864 as against 173,975,082 lbs. in 1863, an increase of 17 per cent. Australia sends us by far the largest quantity, as usual, and shows the greatest increase on the former year, the quantities being 90,037,459 lbs. against 77,173,446 lbs. in 1863, or a rise of 17 per cent.

The wool from the Hanse Towns, and other parts of Europe, the import of which fell off considerably in 1863, has risen again nearly to the point it had attained in 1862.

The supply from British India and the British possessions in South Africa has slightly fallen off.

Decrease. Turning to the articles in which there has been a decrease we find the first to be—

1. Coffee. The quantities imported have decreased by nearly eight millions of lbs., viz.,

From 117,354,217 in 1863
to 109,370,213 in 1864.

This we can only attribute to the very largely increased quantities brought in many previous years, and to the tendency that the vast importations of tea must have to lessen the demand for coffee.

2. Corn and flour have, owing to the same cause as in 1863, and with still more reason, viz., an unusually good harvest, fallen in the quantities imported

From 59,648,092 cwts. in 1863
to 46,506,744 „ in 1864.

In accordance with the Act (27 Vict. c. 18.), passed last session, the quantities of corn on importation are now taken by weight instead of by measure.

We have, therefore, converted the number of quarters imported in 1863 into cwts. for the sake of comparison with 1864, which will account for the discrepancy between these figures and those given for corn in our Report of last year.

The United States show a falling off in the quantities they have sent us from 8,700,000 cwts. to 7,900,000 cwts. of wheat, but notwithstanding the still further decrease of fully 50 per cent. in 1863, as compared with 1862, still send us one-third of our whole supply of wheat.

The importation of corn from France has, owing to a deficient harvest in that country in 1862 fluctuated in a singular manner, having fallen from 900,000 cwts. in round numbers to 147,000 cwts. in 1863, and again risen to 587,000 cwts. in 1864. Next to the United States our greatest supply of wheat comes from Russia, Prussia, Denmark, and British North America, and in all these cases, except the last, there was an increase in the quantity forwarded in 1864. In all other descriptions of corn there is a sensible decrease, as there is also on flour, both of wheat and Indian corn.

3. Silk (raw) shows a very considerable decrease, viz.,

From 10,372,123 lbs. in 1862,
and 9,221,145 lbs. in 1863,
to 5,655,401 lbs. in 1864,

owing to a disease among the silk worms, which has much affected the crop, and diminished the supply alike from all the silk-producing countries.

4. Tea, for the first time since 1856, shows a decline, (as we have already stated), of 9 per cent. viz.,

From 136,806,013 lbs.
to 124,359,243 lbs.

This was, however, to be expected from the immense importations of 1862 and 1863, in consequence of the reduction of the duty in the former year, which cannot fail for a time at least to have overstocked the market. In confirmation of this statement we annex a return of the stock of tea remaining in the bonding warehouses in the United Kingdom at the close of the years 1862, 1863, and 1864, respectively, from which it appears that the quantities in hand are much larger now than they were in 1862 or 1863, or, indeed, in any previous year.

The figures are—

1862	-	-	75,441,167 lbs.
1863	-	-	99,198,012 „
1864	-	-	106,254,761 „

5. Provisions, with the exception of eggs (which have again largely increased in number), have also fallen off in import, from the same cause. They show a total of,

3,668,496 cwts. (excluding eggs),
against 4,602,934 „ in 1863.

The number of eggs imported was

335,298,240 in 1864, as against
266,929,680 in 1863,
and 232,321,200 in 1862.

Home consumption.

We now come to the most interesting part of our subject, both as regards the well-being of the community, shown in their power of consumption, and the effect of such well-being on the revenue of the country.

The review is not quite so favourable in one respect as last year, viz., that there are more articles showing a decrease. Out of eleven principal articles, the consumption of five has decreased, or of four, not reckoning corn and flour, the returns for which vary but little from the imports.

These four articles are as follows:—

Decrease.

Coffee, the consumption of which has fallen			4 per cent.
Currants	„	„	3 „
Raisins	„	„	$5\frac{3}{4}$ „
Sugar, unrefined	„	„	$4\frac{3}{4}$ „

The falling off in coffee, which began in 1861, and has now continued by a gradual decline for four years, must

be mainly attributed to the use of chicory, and the greatly increased demand for tea, both formidable rivals, and cannot, we think, be quoted as a sign of any distress among the poorer classes. It is somewhat singular that the consumption of chicory, which fell in 1862, as compared with 1861, when the rate of duty was doubled, from 87,957 cwts. to 12,423 cwts., rose again rapidly in 1863 and 1864, the returns being

1863	-	97,919 cwts.
1864	-	99,564 „

including both the raw and roasted article.

In the same manner the consumption of currants and raisins as affecting the condition of the poor, should, inasmuch as it varies for each article in different years, be taken as a whole by adding the quantities together. It is true this will show a falling off in the single year 1864, as the return for 1861 did when compared with that for 1860, but this slight decrease of less than 40,000 cwt. when looked at in conjunction with the steady increase of the two previous years, amounting to upwards of 100,000 cwts., if 1864 be compared with 1861, is comparatively of but little moment, especially as the importation of currants and raisins has decreased in 1864 by a much larger amount, and the price of these articles has been consequently higher than usual.

We give the figures showing the quantities entered for consumption—

Currants and raisins,	1860 -	923,079 cwts.
„	1861 -	906,550 „
„	1862 -	979,125 „
„	1863 -	1,076,651 „
„	1864 -	1,037,108 „

We may add that in 1859 the consumption did not amount to 800,000 cwts.; in 1858 it did not reach 700,000 cwts., and in earlier years was under 500,000 cwts.

Sugar.—There is a decline in the consumption of raw sugar in the year 1864, of 460,484 cwts., the exact figures being—

1863	-	9,650,095 cwts.
1864	-	9,189,611 „

This seems at first sight extraordinary, and certainly requires explanation, when it is considered that a very

Causes of decline in

consumption of sugar.

sensible reduction in the duties on all the classes of sugar took place in April, and that in 1863 (by no means a more prosperous year), when there had been no reduction, the consumption had increased from 9,447,132 cwts., to 9,650,095 cwts.

If we turn to Appendix D. we shall find that the alterations made in the scale of sugar duties on the 16th April were as follows:—

Raw Sugar.		Former Rate.	Rate substituted.	Amount of Reduction.
		s. d.	*s. d.*	*s. d.*
1st Quality { White clayed, or equal thereto - - }	per cwt.	16 0	11 8	4 4
2nd Quality { Yellow Muscovado and brown clayed, or equal thereto - }	„	13 10	10 6	3 4
3rd Quality { Brown Muscovado, or equal thereto - }	„	12 8	9 4	3 4
Not equal to brown Muscovado -	„	12 8	8 2	4 6
At the same time the reduction on refined and sugar candy was -	„	18 4	12 10	5 6

We find that the decrease of consumption in the year on the 2nd and 3rd (now divided into 2nd, 3rd, and 4th) classes, amounted to 537,450 cwts., and that there was an increase on the 1st class of 76,966 cwts., the difference being the amount given above, 460,484 cwts.

The principal reason of this apparent decline is to be found in the state of the sugar market at the commencement of the year, *i.e.*, before the reduction of the duties. In those months before the 16th April, there was not only a strong impression that the sugar duties were to be operated on by the budget—(a fact that always checks consumption), but a belief that the supplies of sugar forwarded to the English market would be unusually short. It was asserted, 1st, that the European crop of beet-root sugar (in France, Belgium, and Germany) would yield less than the average, and that consequently more cane sugar would be imported into those countries to make up the deficiency; 2ndly, that the crops in our own West India islands would be very short; and, 3rdly, that owing to the war in America, the sugar-producing states in the South would produce but little, and that, of that

little, none would find its way into the Northern states, who would consequently be obliged to draw their supplies from Cuba, and diminish the quantities available for the British market, from one of the principal sources of our supply. At the same time that these rumours were afloat, much capital that had been invested in cotton, was withdrawn and invested in sugar.

These various causes produced a great rise in the price of sugar, amounting at least to about 10*s*. per cwt., and (this rise being attributed to speculation only) a consequent stagnation of the whole trade, many of the refiners who had sugar stocks in hand selling their sugar in the raw state at a profit instead of refining it, and some contracting their operations and even closing their works entirely. The consumption of the lower qualities of sugar in consequence showed a falling off, in January, February, March, and April, of no less than 479,210 cwts., or more than the whole final decrease in the year. Immediately after the reduction of duties by the budget an improvement took place. In May there was an increase in all qualities, and in June on the 1st and 2nd qualities, and a very trifling decrease in the lower. After this, however, the great reduction in the duty on refined and sugar candy, which we have given above, gave an extraordinary stimulus to the Dutch refiners, whose products had previously been to a great extent kept out of this country by the difference in the duties on refined and raw sugar, but who now derived a double advantage from the reduction of this difference, and from the bounty they received on exportation from their own country. Such a rush of refined sugar, therefore, came into the country from Holland, the importation (as we have already stated) having risen in the nine months after March from 222,180 cwts. in 1863 to 903,117 cwts. in 1864, and the consumption from 201,546 to 748,389 cwts., that a complete panic took place among the refiners in this country by whom the great mass of raw and especially low class raw sugar is entered for duty. The decline of consumption particularly of the lowest class consequently continued throughout the year, and the turning point was not reached till December. In that month, however, the speculative high prices having dropped down and stocks having become very large in bond, confidence was restored, and the trade recovering its activity, the first increase appeared in all the three qualities, and amounted

to no less than 228,000 cwts. in the two lower classes alone.

This has been followed in the beginning of the present year 1865 by considerable increases in all qualities in January and March, and in the two higher in February; the last (the March return) being the largest, and almost reaching 300,000 cwts. Thus by the close of the financial year, 31st March 1865, the whole history of the consumption of unrefined sugar is reversed, and there appears instead of a decrease of 460,000 cwts. in round numbers an increase, on the contrary, of nearly 600,000 cwts.; a sufficient proof that there was no failure, in a financial point of view, in the operation on the sugar duties effected by the budget of 1864.

Appendix U. We annex a return showing the progress of the consumption of sugar of each quality month by month to which we have referred.

Increase. The six articles that show an increase of consumption are,—

Cocoa, which has risen	- -	1½ per cent.
Spirits (rum, brandy, and geneva)	-	13 „
Sugar (refined)	- - -	220 „
Tea	- - - -	4 „
Tobacco	- - - -	1½ „
Wine	- - - -	9 „

Spirits.—The increase in spirits extends to all three descriptions, rum, brandy, and geneva. The increase on rum is larger than it has been in any year since 1853; the growing taste for brandy, which we have mentioned above, not having as yet produced any effect upon the demand for rum. The increase on brandy is the largest on record, and the quantities, which are gradually gaining ground upon those of its rival, have reached the highest point they have ever yet attained. Nor has the consumption of home-made spirits suffered in consequence, the Inland Revenue returns showing a large increase under that head for 1864.

Tea.—The increase in tea is satisfactory, as showing that the improvement in the consumption consequent on the reduction of the duty in 1863, which led to a rise of 8 per cent. in that year is likely to be permanent.

Tobacco.—The rise on tobacco is also satisfactory, and, like that on spirits, is of the highest importance to our

revenue accounts. The consumption of unmanufactured tobacco for the three years has been as follows:—

	lbs.
1862 - -	35,280,837
1863 - -	37,033,867
1864 - -	37,475,176

showing the large increase in 1864 of 441,309 lbs., and this too following immediately upon a still larger one in 1863, both being attributable only to a steady progress in the consuming power of the country and not to any alteration or reduction of duty. Unlike the import returns, which show a large rise in the unstemmed leaf and a falling off in the stemmed, the consumption of stemmed has risen by nearly a million of pounds and the unstemmed fallen off nearly half a million. This is, however, only accidental, as the very opposite result was seen in last year's returns.

The manufactured tobacco on the other hand has enjoyed the advantage of a considerable reduction in duty as lately as March 1863, and shows in consequence a rapid advance in consumption; the quantities being

	lbs.
1862 - - -	334,150
1863 - - -	582,379
1864 - - -	764,345

The stocks, also, of tobacco both unmanufactured and manufactured, remaining in bond are much larger than before; the return for the three years being—

	lbs.
1862 - -	63,312,180
1863 - -	67,741,516
1864 - -	77,365,695

Wine.—Last year we recorded that the consumption in 1863 of this our last article had exceeded that of any previous year but 1861. We have now gone far beyond even that favourable return, and have to show a consumption of 11,456,715 gallons as against 10,478,057 gallons in 1863 (a rise of nearly one million gallons), and 10,787,091 gallons in 1861 (a rise of nearly 700,000 gallons).

The increase beyond 1863 extends to the wine of all countries, with the exception of those from the British possessions in South Africa, from Hamburg, and from Madeira.

The Cape wines have not recovered from the loss of the protection they formerly received, nor those from Madeira (though they showed a slight improvement in 1863) from the almost total destruction of their vines some few years ago. The case of the wines from Hamburg we shall refer to in a subsequent paragraph of this report.

The red wines from Spain, being cheap and of considerable strength, have found favour in the market, and the consumption, like the import, has considerably increased in 1864 as compared with 1863.

The following return of the quantities of wine entered under each class and according to colour, which we give as usual, still shows the great preponderance of the stronger over the weaker classes of wine, which we have before observed upon.

	Red.	White.
	Galls.	Galls.
Under 26 degrees - - - -	1,241,895	268,134
„ 42 „ „ - - -	3,489,507	5,396,011
42 degrees and upwards - - -	12,916	22,667
In bottles, under 42 degrees - -	212,487	813,098
Total - -	4,956,805	6,499,910
	6,499,910	
Total red and white - - -	11,456,715	

The consumption of the stronger wines, therefore, amounts to 9 millions of gallons out of a total consumption of 11½ millions.

Revenue.

The gross revenue derived from customs duties for the years 1863 and 1864 and the aggregate net receipts, after the deduction of drawbacks and repayments, stand as follows:—

Appendix E.

	1863.	1864.	Decrease.
Gross receipt	£23,588,932	£22,498,210	£1,090,722
Deduct drawbacks and repayments -	371,295	204,707	166,588
Net receipt	£23,217,637	£22,293,503	£924,134

showing a decrease in the net produce of only 924,134*l.*, though the loss on the net receipt of sugar, molasses, and

other articles in the manufacture of which sugar is used, amounts, in the year alone, to,— Appendix F.

£1,089,877 on sugar.
65,791 on molasses.
1,992 on other articles.

Total £1,157,660

and that of corn to 169,230*l.*

Again, the aggregate loss of net revenue as compared with 1862 is only 1,416,002*l.*, though the losses on tea and sugar from the reductions in 1863 and 1864 amount, as compared with the revenue derived from them before such reductions, to:—

		£
Tea -	1863	927,766
	1864	221,502
		1,151,268
Sugar -	1864	1,157,660
	Total	2,308,928

Another encouraging feature in the revenue account is the increased receipt from tobacco, which, notwithstanding that the great reduction of duty on the manufactured article in 1863 had come into full operation in 1864, shows, not indeed so large an increase of revenue as in 1863, but still the very satisfactory one of 105,314*l.* Indeed, from Appendix E. Appendix F., which gives the net receipt divided into quarterly periods, it is difficult to trace any damaging effect produced by this reduction on the receipt, the return for the last quarter of 1863, and for three out of four quarters of 1864, giving a larger revenue on tobacco than was reached in the first quarter of 1863 before any alteration of duties took place.

In tea the change is more manifest in the quarterly division, for, though the receipt was larger in the quarter in which the reduction took place than in the previous one, yet from that moment it has continued to decline till the end of 1864 by amounts slightly varying every quarter till the aggregate net loss in 1864 as compared with 1862 given above, viz., 1,151,268*l.*, is arrived at.

Our usual summary of reduction of duties and recovery of the revenue will this year stand as follows, the calcula- Reduction duties and

recovery of the revenue.

tion being taken with the qualification given in our last report, which we repeat below :—

		£
Appendices E. and F. Appendix T	Net revenue of 1863 - - -	23,217,637
	Amount of duties reduced in 1864, viz., sugar and molasses - - - 1,741,272*	
	Other articles into which sugar enters - - - 3,112*	
		1,744,384*
	Leaving the estimated revenue for 1864 -	21,473,253
	Recovery in 1864 - - -	820,250
	Net revenue in 1864 - - - -	22,293,503
8th Report, page 20.	Total amount of duties taken off in 1860, 1861, 1862, and 1863 - - -	4,335,051
	Add amount taken off in 1864 - -	1,744,384
	Total amount taken off in five years -	6,079,435
	The recovery in the four years was also stated in our last report to have been -	2,848,364
	And in 1864 it is - - -	820,250
	Total recovery of revenue in five years -	3,668,614

It must be observed that the largest reduction made in 1864, viz., on refined sugar, and that which had been followed, as we have already stated, by the most distinct increase of consumption, did not take place till a later period than usual, viz., 5th May.

Appendix G. Cost of collection.

Turning to Appendix G., we see that the cost of collecting the revenue has somewhat increased up to the end of March 1864, the financial year, as compared with the same period in 1863, viz., from 2*l.* 19*s.* 8*d.* on the gross receipt, and 3*l.* 0*s.* 5*d.* on the net produce, to 3*l.* 2*s.* 11*d.* and 3*l.* 3*s.* 10*d.* respectively.

A still larger comparative expenditure will probably be shown by the return ending 31st March this year, both because the revenue has been again reduced by the

* These amounts are calculated on the consumption of twelve months, and the duties on sugar, &c., not having been reduced till the 16th April and the 5th May, the whole loss would not in strictness be applicable to the revenue of the year ending 31st December. It is, however, more convenient, in comparing several successive (non-financial) years, to appropriate to each the whole of the reduction decided on by the Legislature in that year, in preference to dividing the loss to the revenue between broken periods of two different years; and, as this plan has been adopted in our previous reports, we propose to continue it, the general result on a comparison of several years being perfectly correct.

surrender of duties, and because the transfer of the custody of British spirits from the officers of excise to those of this revenue, which has taken place to a large extent during the last year, and to which we shall again refer, has made in some places the appointment of additional officers necessary.

Fluctuations of trade at different ports.

We have stated the whole gross customs revenue of the United Kingdom for the year 1864 to have been 22,498,210*l.*

Appendix B.

Dividing this large sum between the respective ports, and adopting our usual classification, we find that the revenue of

	£
London has been - -	11,491,412
Liverpool - - -	2,893,445
The remaining English ports	3,239,202
The Scotch ports - -	2,826,827
The Irish ports - -	2,047,324
	22,498,210

On comparing these with the returns for 1863, it appears—

	£
That the revenue of London (which amounts to more than half the total revenue of the country) shows a falling off as compared with 1863 of - - - -	482,985
Of Liverpool - - - -	239,956
The remaining English ports - -	39,359
The Scotch ports - - - -	221,147
The Irish ports - - - -	107,275

Appendix B.

Which together make up the whole deficiency on the gross receipt of £1,090,722.

Appendix C. English Ports.

Of the English ports, exclusive of London and Liverpool, 38 show an increase and 43 a decrease. The largest falling off next to London and Liverpool is at Bristol (47,598*l.*), nearly the whole of it in sugar, the staple commodity of that port, owing to the reduction of the duty; the decrease has also been considerable at Goole (35,704*l.*), owing to the increasing tendency to bond in preference at Leeds and Bradford; at Southampton (23,494*l.*), owing to the failure of an importer of tobacco from Guernsey, and to the shutting up of a sugar refinery; at Manchester (15,932*l.*) nearly the whole on sugar; and at Grimsby (14,580*l.*), on sugar and corn.

The most important increase has been at Hull (51,123*l.*) owing to large importations of tobacco and refined sugar

since the reduction of the duty; Chester, Shields, and Exeter come next on the list, and show a substantial increase, the first port, owing to the flourishing state of the manufacturing trade in that district; the second, owing to the increasing business of a tobacco manufacturer; and the third from an increased consumption of spirits; while considerable improvement has also taken place in the revenue of Stockton, Ipswich, Whitehaven, Hartlepool, and Rochester.

Scotch.

In Scotland the large ports on the Clyde of course give plain evidence of the reduction of the sugar duty.

Greenock shows a falling off of - £176,288
Port Glasgow „ „ - 33,249

and

Glasgow (where a refinery has also failed) of - - - 15,473

Leith and Montrose show also a considerable reduction, while the revenue of Aberdeen, Dundee, Kirkaldy, and Troon (made an independent port in July 1863), has considerably improved.

Irish.

In Ireland there is not a single port which shows an increase worth mentioning; while Dublin (from sugar), Belfast (from tobacco), Cork (from corn), Waterford, Limerick, and Londonderry all show a considerable falling off.

Returns of shipping.

The Shipping Returns, which we give as usual in Appendices L., M., and N., show—

1st. That the total tonnage of ships entered inwards and cleared outwards has risen during the year from 26,738,733 tons to 27,204,509 tons, an increase of 525,776 tons, the whole being in the British shipping, the tonnage of which has risen from 17,019,392 tons to 18,201,675, while that of foreign shipping has fallen off.

2ndly. That 2,789 new vessels of 971,198 tons (an average of nearly 250 tons per vessel) have been built and registered during the year 1864; and

3rdly. That the aggregate number of British vessels existing on the registry in the United Kingdom, the Channel Islands, and the British Plantations has slightly diminished, though the amount of their tonnage is increased and more men are required to compose their crews than in 1863.

The following are the figures:—

	Vessels.	Tonnage.	Men.
1863 -	40,195	6,624,403	326,366
1864 -	39,644	6,843,461	327,941

We now come to the various details connected with the trade of the port of London, which we are accustomed to lay before your Lordships every year. London. Trade.

The number and tonnage of vessels entering inwards was— Appendix C.

	Number.	Tonnage.
In 1863	11,608	3,441,519
In 1864	11,206	3,359,782
Decrease	402	81,737

The number of officers boarded on vessels inwards was Out-door Department.

In 1863	21,438
In 1864	19,307
Decrease	2,131

Duties. Waterguard.

This is to be accounted for partly by the number of vessels being less than in 1863, partly by the arrivals having on some days been so numerous that sufficient officers were not available, and partly because the number of officers at Gravesend has been reduced in consequence of the demand for their services in London to guard lighters, as will be seen below.

The number of officers boarded on vessels outwards was—

In 1863	4,642
In 1864	4,986
Increase	344

The vessels inwards being fewer in number, more officers were available for those outward bound, many of whom were placed on board in London, which could not have been done had not the number of officers at Gravesend been reduced.

The number of men boarded on lighters in the river, both inwards and outwards, was—

In 1863	12,017
In 1864	15,674
Increase	3,657

The number of nightly visits paid by superior officers to men boarded on vessels or on lighters was

In 1863 - - - -	12,180
In 1864 - - - -	12,061
Decrease - -	119

The difference is more apparent than real, as, in consequence of so many vessels working during the night, the superior officers were frequently making nightly visits in the discharge of their duty which are not recorded as "special," so that practically the men boarded on vessels and on craft were visited more frequently in 1864 than in 1863.

The number of vessels which were rummaged at Gravesend was 1,040 against 1,223 in 1863. This regulation, which we referred to in our last report, continues to work satisfactorily, the revenue is better protected, and 428 officers were thus rendered available for boarding other vessels in the course of the year.

The total number of ships which could not be boarded at Gravesend for want of officers was 1,037, and in most of these instances care was taken to secure the revenue from risk, by a selection of those vessels to remain unguarded, which were least open to suspicion, on account of the nature of their cargoes and the ports from which they came. These vessels were, however, rummaged at as early a period as possible, and placed under the supervision of the officers stationed in the docks or river.

Waterside. Turning to the duties of the force employed on waterside duty. The number of packages of goods re-weighed and re-packed in the bonding warehouses,

Was in 1863 - - -	658,762
„ 1864 - - -	917,227
Increase - - -	258,465

The number of packages of bonded and drawback goods shipped for exportation by the searchers was

In 1863 - - - -	4,440,506
In 1864 - - - -	4,062,373
Decrease - - -	378,133

The quantity of timber measured singly, at a cost to the Crown of less than 1½*d.* per load, is rather greater than last year, the figures being

	Loads.	Pieces.
1863 - -	205,254 - -	340,904
1864 - -	240,776 - -	409,431
Increase -	35,522 - -	68,527

The number of samples of sugar assessed for duty was—

	Samples.		Packages.
In 1863 -	325,345	representing	1,751,539
In 1864 -	345,748	„	1,632,863
Increase	20,403	Decrease	118,676

This shows an increase in the number of samples tried over last year, but, owing to greater variety in the qualities of the sugar, a decrease in the number of packages represented by those samples.

The number of packages of refined sugar crushed and packed for exportation on drawback at the various sugar refineries was—

In 1863 -	41,002	packages,	weighing	79,431 cwts.
In 1864 -	30,946	„	„	55,050 „
Decrease	10,056	„	„	24,381 „

The number of passengers arriving in the port, by river and railway in 1864 was much greater than in 1863.

The return is as follows :

	Passengers.	Packages.
Examined at Gravesend and Thames Haven*	5,170	10,914
On board steamers coming up the river -	36,895	71,089
At the various docks and wharves - -	9,878	50,329
At London Bridge and Charing Cross Railway Stations - - - -	32,626	75,152
Total - - - -	84,569	207,484

The total number in 1863 having been 83,886 passengers and 183,759 packages.

* Thames Haven was approved as a place for landing passengers in 1855. But in 1859 the officers were withdrawn, owing to the discontinuance of the traffic. It was again approved on 26th February 1864.

Importation of cattle, &c.

The total number of animals imported at this port, and inspected by the cattle inspectors during the year was as follows :—

Country.	Beasts.	Calves.	Sheep and Lambs.	Pigs.
Germany - -	9,749	10	80,266	7,567
Holland - -	66,386	26,022	220,718	23,539
Belgium - -	3,539	3,710	7,431	1,310
Denmark - -	31,039	7	29,853	—
Portugal - -	1,580	1	—	—
Spain - -	4,419	—	—	1
France - -	296	211	1,243	18,299
Total -	117,008	29,961	339,511	50,716

Making in all 537,196 head, as against 473,345 in 1863, and 369,267 in 1862. It is, therefore, apparent that the increase in the number of foreign animals imported has been very great.

The number of diseased animals detained and slaughtered during the year was as follows,—1,322 beasts, 179 calves, 2,037 sheep, and 3,392 pigs, of which 289 beasts, 116 calves, 752 sheep, and 1,435 pigs were found to be unfit for human food, and were in consequence destroyed; the remainder were given up to the consignees.

The diseases with which the animals were affected were the same as have been mentioned by us in previous reports.

Although the number of animals imported directly at this port exhibits a great increase over former years, it by no means shows the total increase of the supply brought to the metropolitan districts, inasmuch as during the last year a new route, not included in our last year's return, viz., by Thames Haven,* has been opened, by which large numbers of foreign animals landed at that place were brought to London.

The condition of the animals generally is reported to us not to have been so good as it has been in previous years, and this was attributable, no doubt, to the remark-

* The number of cattle imported through Thames Haven in 1864 are as follows:—

Oxen and cows - - - - -	11,054
Calves - - - - -	5,044
Sheep - - - - -	8,342
Pigs - - - - -	461

which are included in the above table.

able drought which prevailed last year on the continent as well as in this country.

Another peculiarity in the importations of this last year is the great quantity of pigs brought from France, there having arrived no less than 16,272 of these animals from that country during the year, compared with 648 only in 1863.

The Select Committee of the House of Commons, to whom two bills upon the subject of cattle diseases, and their management, both in this country and on importation, were referred, after hearing much evidence on the subject, reported in accordance with the views of our cattle inspectors, who attended as witnesses before them, and recommended a relaxation, to a certain extent, of the existing rules, considering that it would be sufficient, in cases where the disease was of a character not likely to impair the fitness of the flesh of the animals for human food, to detain only the affected animals, and allow the remainder of the cargo, if they showed no symptom of the disease, to pass. The bills before Parliament were withdrawn, but an order was issued by the Privy Council for carrying into effect the recommendation of the Committee. Since that time our cattle inspectors have governed themselves strictly by this order, but sufficient time has hardly yet elapsed to enable us to report whether this relaxation will or will not impair the efficiency of the measures taken to prevent the introduction of disease.

In the meantime it has undoubtedly had the effect of greatly augmenting the labours of our inspectors, inasmuch as it is necessary in order to effectually carry it out, that a more immediate and minute examination of each animal be separately made, in order to arrive at a conclusion as to its healthiness or otherwise, and to avoid disputes with the importers. They are also deprived of the advantage they possessed under the former system, of detaining the animals for a time to enable them to satisfy any doubts they might have entertained.

We annex a return of the ports at which cattle, &c., have been imported during the past year, and the numbers imported at each port. Appendix S.

As the vast trade of the port of London continues to increase, the demand for accommodation in the port for the landing, shipping, and warehousing of goods under Increased bonding accommodation.

bond, and for carrying on the various operations allowed to be performed in warehouse, increases also every year. And we find it almost impossible to resist, even with the support of your Lordships, the pressing applications for fresh approvals and increased privileges that pour in upon us day by day, even though by granting them additional expense is entailed upon the Crown.

Among the places where additional floors and compartments have been required to be annexed to those already privileged, or where new warehouses and vaults have been approved during the past year, are the following:—

Mint Street Warehouses, Minories.
Cotton's Wharf and Depôt Wharf, Tooley Street.
Beal's Wharf, Southwark.
The Trinity Warehouses, Coopers' Row.
Symon's Wharf, Southwark.
Red Lion Wharf, Thames Street.
Goodchild's Warehouse, Fenning's Wharf, Tooley Street.
Hibernia Wharf, London Bridge.
Messrs. Barber's Premises, Coopers' Row.

Some rooms also at St. Olaves, Crutched Friars, at the Metropolitan Warehouses, and at Fenning's Wharf, London Bridge, have, amongst many others, been approved for the various operations of bottling, vatting, and compounding wines and spirits in bond, while sufferance privileges have been conceded to Plaistow Wharf, in the county of Essex, below the Victoria Docks, and to Eagle's Wharf, at Wapping.

Notwithstanding the additions to the out-door department which were made in 1863, the strength of the establishment is at times insufficient to meet the urgent demands made for dispatch. The work to be done by the officers of Customs is distributed over a large area, and, as long as every merchant continues to insist upon his own particular business being attended to without delay, and so great a competition exists between dock companies and wharfingers, and between wharfingers themselves, it will constantly become necessary to add to the force employed, and thus to involve the Crown in an expenditure which might be avoided were a little more consideration shown to the wants and convenience of others.

The work in nearly all the in-door departments in London continues steadily increasing. Indoor department.

In the Long Room the number of entries passed and of bonds prepared during the year 1864 is 922,257 as against 905,345 in 1863. The particulars are as follows:— Long room.

	1863.	1864.
Duty entries, 1st branch - - - { Sugar, Tobacco, Wine, and Spirits. }	303,376	311,022
2nd „ - - Tea -	392,888	407,401
Free entries - - - - -	107,191	104,078
Warehousing ditto - - - - -	49,464	48,666
Bonds for exportation and removal - - -	52,426	51,090
Total - - - - - -	905,345	922,257

In addition to the ordinary bonds above stated, there are no less than 116 general removal bonds, which have been acted upon to the extent of about 300 entries daily. These bonds, which give great facility to the merchant, have not been alluded to in any of our reports since that of 1857. They are given, as your Lordships are aware, to cover the entire amount of the aggregate removal transactions of any one firm, and to save the trouble of giving a separate bond for each removal. They run on from year to year without renewal, and afford always sufficient security to the Crown, care being of course taken that the whole of the transactions outstanding at one time are not more than are covered by the amount of the penalty of the bond. The number of these bonds has risen from 80 in 1857, to the present number of 116 in 1864 in the port of London alone. Out of this 116, 99 are for the single article of tea, 14 for wines and spirits, and three for tobacco.

We have already stated that the general imports of tea into the United Kingdom fell Tea office.

from 136,806,013 lbs. in 1863,
to 124,359,243 lbs. in 1864. Appendix P., No. 1.

The imports into the port of London, however, did not decrease in a similar ratio, but rose on the contrary, as compared with the general imports, from 96 to 98 per cent., being no less than 122 millions in round numbers, out of 124. Out of the large amount, 88,637,099 lbs. entered for home consumption, duty was paid in London on 56,124,794 lbs., or upwards of 63 per cent. Appendix P., No. 2.

Appendix P., No. 3.

The quantity exported from London in 1864 was 26,619,957 lbs., or nearly two millions of pounds more than in 1863, whilst the amount removed under bond coastwise was about the same, viz., 31 millions of lbs. The number of documents prepared and issued in the tea office in connexion with this vast and increasing trade has risen in consequence from 539,857 in 1863 to 565,821 in 1864. These would have been still more numerous had not several alterations have been made in the mode of carrying on the business during the past year, which have simplified the working of the office, without augmenting the staff of clerks employed. We give the full details connected with the tea office as usual in Appendix P., 1, 2, and 3.

Controller of accounts. Legal Quays and Victoria Docks.

The business of the department of the Controller of accounts for the Legal Quays and the Victoria Docks in 1864, as compared with 1863, shows an increase in the number of documents and operations in warehouse, as is seen from the following tabular statement :—

	1863.	1864.
Number of ships - - - -	6,859	6,341
Over-entries - - - - -	1,060	705
Warehousing Warrants - - -	20,883	20,746
Home consumption do. - - -	120,105	125,001
Exports - - - - -	42,112	40,219
Removal coastwise - - - -	7,031	7,612
Removals in port from one station to another.	1,288	1,388
Bottlings - - - - -	939	898
Vattings - - - - -	776	558
Tobacco deposited under new Act - -	180	143
Total Documents and Operations -	194,374	197,279

No addition has been made to the establishment of this office since the four extra clerks appointed in 1863, but we are informed that, should the increase of the business, as stated above, be maintained, it will be necessary permanently to strengthen the force employed.

The following is the return for the London Docks:— London Docks.

	1863.	1864.
Deliveries for home consumption - -	90,226	94,350
Ditto exportation stores and removal coastwise - - -	32,209	31,148
Ditto removal to other warehouses in the port - - -	1,258	1,516
Vatting of wines and spirits - -	1,775	1,562
Bottlings ditto - - -	1,935	1,827
Rackings ditto - -	8,979	9,521
Fortifyings of wine - - -	902	984
Letters of advice coastwise - - -	7,374	7,974
Over-entry certificates - - -	1,862	1,744
	146,520	150,626

Increase in the year of 4,106 operations and documents, or 2¾ per cent.

During the year the staff at this station was reinforced by five extra clerks, whose services are still reported to us as being necessary. We are further informed that so much of the present year 1865 as has passed exhibits an increase of work as compared with 1864.

The business at the St. Katharine's Docks, which showed a falling off in 1863 as compared with 1862, though it has not reached the point it attained in 1862, is again steadily increasing. We give the comparison for four years, showing a considerable advance over the return for 1861. St. Katharine's Docks.

	1861.	1862.	1863.	1864.
Deliveries for home consumption - -	31,529	31,856	29,142	29,438
Ditto export and coastwise - -	20,676	24,268	25,235	26,549
Ditto removals to other warehouses	391	335	299	281
Vattings - - - - -	304	297	287	229
Bottlings and drawings off - -	670	788	795	659
Fortifyings - - - - -	186	164	126	153
Letters of advice - - - -	3,060	3,298	2,841	2,934
Over-entry certificates - - -	620	560	561	480
Rackings and fillings - - -	1,161	1,186	1,019	917
	58,597	62,752	60,305	61,640

These figures show an increase in 1864 of 1,335 operations and documents, or 2 per cent., over 1863.

Very little progress has been made as yet with any alteration in the mode of conducting the business of these three docks, the Victoria, London, and St. Katharine's, since the Act passed for the amalgamation of the Companies, so as to

enable us to give any opinion as to the effect this measure will have upon our official arrangements, or the extent of the Customs establishments that will finally be required. The new Company has indeed expressed an intention of making these (the St. Katharine's) Docks the sole depôt for the warehousing of all importations into the port of cigars, Cavendish, and the superior kinds of bale tobacco. With this view the Company requested and obtained our permission to remove all the tobacco formerly stored in the Mint Street warehouses, belonging to the Victoria Docks, and under the superintendence of the officers in the Legal Quay Department, to St. Katharine's Docks. We find, however, that this removal has been objected to by the trade, and it now seems doubtful whether the old depôt in Mint Street will not be retained. Beyond the employment temporarily of extra clerks to meet the pressure caused by this alteration, no change has been made in the establishment of the St. Katharine's Docks in the course of the year 1864, which remains, indeed, the same as was fixed in 1861.

East and West India Docks.

The East and West India Docks show an increase of 883 documents, and a small decrease in the number of vatting accounts recorded in the books, though more casks, to the number of 444, have been operated on; 16 more ships and craft brought warehoused goods into these docks in 1864 than in 1863. The following is the tabular statement showing the results:—

Documents.	1863.	1864.
Home consumption entries	33,282	33,834
Export	7,432	7,241
Coastwise	2,966	3,363
Letters of advice	2,862	3,240
Over entries	4,170	3,917
	50,712	51,595
Vatting accounts, exclusive of vattings to original ships	1,156	1,099
,, ,, ditto of casks drawn off	19,527	19,971
Ships, craft, &c. with warehoused goods	1,094	1,110

The establishment has undergone no alteration, though it has been found necessary to employ two extra clerks throughout the year.

The business of the Export Department shows but little

alteration from its state in 1863. The comparison of the two years is as follows:— Export or searcher's department.

	1863.	1864.
Entries of free goods exported - -	136,548	141,701
Entries of goods exported from the warehouse as merchandise - - -	48,920	48,474
Ditto Ditto as stores - -	22,394	20,552
Transhipment entries - - -	6,782	6,640
Entries for drawback of Customs - -	3,625	2,769
Ditto Ditto Excise - -	11,334	11,434
Number of certificates of origin issued under the French treaty - - -	3,657	3,272
Transfer entries - - - -	2,702	2,654
Total - - -	235,962	237,496

Increase, 1,534 documents.

There has been no increase of establishment during the past year; but, as the number of clerks was fixed in the year 1860 with reference to the amount of work to be performed in that year, and as since that time the most laborious and important part of the duties of the department, viz., the certifying of the due exportation of goods shipped as merchandise and stores, has increased more than 50 per cent., and the total work of the office 12 per cent., it is probable that it will be necessary soon to add to the strength of the establishment.

Outports.

There is but little for us specially to report about the trade and establishments at the outports.

Removal of customs from Arundel to Littlehampton.

Early in 1864 the port of Arundel was approved for the importation of wine in casks.

Later in the year we were enabled to effect a change at that port which we have long considered would be very advantageous to the public service, as well as to the merchants and traders of the port, and which has formed at different times the subject of various reports to your Lordships, viz., the transfer of the Custom House and Customs establishment from the town of Arundel to Littlehampton, where the whole of the shipping business is conducted.

We received your Lordships' authority for this change on the 18th March, and the removal of the officers, with all their books and documents, was effected in April, a temporary office at Littlehampton being occupied by them, pending the completion of the Custom House which the London, Brighton, and South Coast Railway Company

have undertaken to build and let to the Crown. The change has been well received by the principal inhabitants and traders of the port, and the circumstance of a steam traffic having lately sprung up between Littlehampton and the Channel Islands, has had considerable effect in silencing all opposition to a measure which has always appeared to us to be on all accounts most desirable.

Approval of Hayle as an independent port.

On the 27th June your Lordships were pleased, on our recommendation, to constitute Hayle, in the county of Cornwall (which had formerly been a creek in the port of St. Ives, and latterly a creek in the port of Penzance,) an independent port; and this arrangement, was carried into effect in the months of September and October.

By a further order of the 11th August 1864, your Lordships were also pleased to approve of Hayle as a port for the warehousing of all dry goods which may be legally imported there.

Harwich, approved as a tobacco port.

On the 7th September we approved of Harwich as a port for the importation and warehousing of tobacco. This port has for the last 18 months been gradually rising in importance. In October 1863 the Great Eastern Railway Company first began to run cattle and cargo steamers, carrying occasional passengers, between that port and Antwerp and Rotterdam; and in the summer of 1864 a regular tidal service between these two ports and Harwich was set on foot by them. The Company also, by the erection of new warehouses and sheds, and a gigantic hotel, by bringing down their lines of rails to the water's edge, and by other measures, have been making great efforts to attract and secure a passenger traffic from the Continent. We are informed that this route is increasing in popularity, and that the number of passengers is likely rather to increase than diminish.

Increase of establishment.

In October last we were obliged to apply to your Lordships to sanction a revised establishment of officers to meet the growing requirements of the port, and on the 20th of that month we received your Lordships' authority to increase the force employed from 8 to 14 persons, which (the port having been recently inspected by a member of our Board) we have no reason to consider to be by any means a larger force than is necessary.

Inland bonding towns.

There is but little to remark as to the progress of trade and Customs business in the inland bonding towns.

Bradford.

At Bradford, the first approved, the revenue has increased from 44,031*l.* in 1863, to 46,803*l.* in 1864.

At Halifax, where, as we stated in our last report, but little advantage appears to be taken of the privilege of bonding, there is, however, a sensible increase of revenue, viz., from 8,244*l.* to 10,090*l.* The amounts received, however, are but insignificant, when the flourishing and populous character of the town is considered. Halifax.

At Leeds, where the accommodation is excellent, and the warehouses on a magnificent scale, the trade will probably eventually be the largest. The bonding only commenced in November 1863, and the revenue already received averages about 3,000*l.* per month. It must be observed, as we have always stated in the numerous discussions that have taken place on the policy of inland bonding, that these sums do little more than represent a like amount of revenue withdrawn from the account of some sea-port. We have observed already in this report on the effect produced by the payment of duties at this town upon the revenue of Goole. Leeds.

Owing to the growing requirements of trade it has been found necessary to make certain additions to some of the out-port establishments in 1864. These have resulted in an increase altogether of 60 officers distributed amongst 17 ports, at an additional expense of 6,822*l.* On the other hand, however, there has been a reduction at 9 ports of 10 officers and a saving of 1,313*l.*, so that the whole increase has been 50 officers and 5,509*l.* Alteration of establishments at the out-ports.

The largest additions have been to Glasgow of three clerks and two extra clerks; to Grimsby (where trade is rapidly increasing) of one examining officer and five outdoor officers; to Harwich, in consequence of the steam traffic we have already referred to, of one clerk, one examining officer, and four outdoor officers; to Hartlepool and Newcastle, of six outdoor officers each; and to Hull, of sixteen.

General questions.

The International Conferences between the representatives of this country, France, Holland, and Belgium, on the subject of the drawback to be granted by the respective governments of such countries on the exportation of refined sugar, which were first held in Paris in 1860, were resumed in that capital in September last, and their deliberations resulted in an arrangement that was subsequently embodied in a Convention which was signed in Paris on the 8th November by the diplomatic representatives of the four Powers; but, as the constitutions of International conferences on the subject of duties and drawbacks on sugars.

Holland and Belgium require that the Convention should be formally approved by the legislative bodies of those countries before their governments can finally exchange ratifications, some delay has necessarily arisen in the completion of this treaty, which, however, it is not likely will extend beyond the beginning of July in this year.

The principal object of the Convention is to abolish the old-fashioned and objectionable system of attempting to create and foster an artificial export trade in refined sugar, by granting to the exporting merchant, under pretence of returning the duty paid on the raw sugar before it was refined, an avowedly larger sum than the actual amount of such duty.

To effect this object the Convention stipulates that the four Governments shall institute a series of practical scientific experiments in actual sugar refining, to be carried on at the joint expense and under the joint control of the contracting powers, and that the result of such experiments shall be adopted as the basis of mutual legislation on the above points. Seeing that the sugar trade is now in most European countries subjected to various restrictive and prohibitory laws which fetter commerce and restrict consumption; this Convention, if successfully carried out, cannot fail to produce important and valuable advantages to the commerce and people of all the countries concerned.

It will be in your Lordships' recollection that throughout the conferences held in Paris, which have led to this Convention this department has been represented by Mr. Ogilvie, one of our Surveyors-General, who has been called upon to take a very active and responsible part, and it has moreover been recently arranged by the delegates of the four countries that, in carrying out the experiments in refining, the entire superintendence thereof should be entrusted to the Customs authorities of France and England, represented on the one side by M. Barbier and on the other by Mr. Ogilvie.

Removal of Customs officers from London Bridge to Charing Cross.

In consequence of the completion of the South Eastern Railway Company's line to Charing Cross station, an application was made to us early in the year for the discontinuance of the examination of baggage at London Bridge as heretofore, and the transfer of the officers employed on that duty to Charing Cross station, there to carry on the required examination. As the company had

already provided the necessary accommodation for the purpose, and were prepared to defray the additional expense in which the Crown would be involved by the removal of their officers to a greater distance from the Custom House, we saw no reason to refuse a compliance with this request. The officers have therefore been removed from one station to the other, the baggage room, &c. at London Bridge converted to some other purpose, and the new system has been in full operation since the 1st May, upon precisely the same terms as to attendance, &c. and under the same regulations as were in force at London Bridge.

Warehousing of British spirits in Customs warehouses for home consumption.

On the 28th April an Act was passed to amend the laws relating to the warehousing of British spirits, which up to that time were only allowed to be warehoused in Customs warehouses for exportation or for ships' stores, by extending such permission to their delivery for home consumption also from such warehouses on payment of the duty, under the regulations applicable to the delivery of British spirits from excise warehouses.

In consequence of this change in the law we issued in August a new code of regulations, which was approved by the Inland Revenue Department, the object of which was to ensure as far as possible uniformity of practice between the Customs and Inland Revenue officers in the mode of charging the duty on such spirits, and, though in some few instances our officers may, from being previously unacquainted with the Inland Revenue system of gauging, (which, as your Lordships are aware, is different from that in use in this department,) have departed slightly from the regulations laid down, we have every reason to believe that the general practice is consistent with those regulations, and that the new system is working satisfactorily. That the concession made has been gratefully received, is we think evident from the numerous applications that are daily made to us, either for the removal of British spirits from the Inland Revenue to our warehouses, or for the approval of fresh premises for their reception. The amount also paid in duty to us, since the passing of the Act, and by us afterwards transferred to the account of the Inland Revenue, is no less than 347,845*l.*, and has been increasing week by week, the return for the last week alone (ending 6th May 1865) being 14,274*l.* We need scarcely add that great additional labour is imposed

upon this department by the change, and that the expense of collecting and accounting for these large sums, which apparently increases our cost of collection, ought certainly not to be charged against the Customs Revenue, to the amount of which it in no way contributes.

Alteration of mode of charging duty on corn.

In August we issued a general order to our officers giving the directions that seemed to us to be necessary for carrying out the provisions of the law, passed during the Session, for charging the duty on corn in future by weight instead of by measure. The principle of this order was not to enforce at all ports the compulsory weighing of the corn, but to leave to the merchants the option of either weighing or measuring, and to lay down one uniform rule by which the weight was to be ascertained from the measure at ports where the plan of measurement was still resorted to without any extra expense being thrown upon the Crown. We have every reason to believe that the new system is working satisfactorily, and meets with the approval of the trade. Two or three questions have arisen as to the rights of sworn meters, which, however, as a whole have not been materially interfered with. It was always understood in the discussions that took place upon the subject of this change, which was adopted entirely at the desire of the trade, that it would probably involve a trifling loss to the Customs revenue.

Importation of Humbro' wine.

The regulations which we explained fully to your Lordships in our report of last year, and which we had found necessary in order to check the continual importations of spurious wine, or rather of mixed spirits under the denomination of wine, have already had a very salutary effect. Not only have the importations of this factitious article very much fallen off in 1864 as compared with 1863, (as already mentioned in this report,) but the specimens that still are brought into this country are decidedly improved in character, and possess a much larger share than formerly of the legitimate constituents of wine in their composition. The detentions are therefore much less frequent than at the time we forwarded our last report, and are indeed becoming very few in number. We have to express our obligations to the great assistance we have received from Mr. Phillips of the Inland Revenue Department in this matter, and also to acknowledge the support which has been given us by the most influential

members of the wine trade in our attempts to check these spurious importations.

Revised tariff.

The Board of Trade having in December transmitted to us a memorandum of certain additional articles, which their Lordships, with the object of improving and completing the statistical records of the country, wished to be inserted in the printed list of articles of merchandise, imported into the United Kingdom, and of articles of British produce exported therefrom, and the Inspector General of imports and exports having stated to us that the list required amendment, we authorized him to make the necessary corrections and to insert into the revised list the additional articles required by the Board of Trade. On the 12th December a revised tariff was approved by us and issued for the guidance of the officers and the trade under your Lordships' authority, showing the designations by which all articles of merchandise are to be distinguished and the denominations, whether of quantity or value, by which they are to be stated in the Customs entries, together with the rates of duty with which in certain instances they are chargeable. By this list it appears that the number of articles still subject to duty constituting principal or separate heads in the tariff, (excluding the subordinate divisions of such heads) is 52, and that, including such subordinate divisions, the total number of articles is 142.

Bonds of the European Assurance Society taken.

In April 1864 the question of accepting the bonds of the European Assurance Company as security for officers and others in lieu of those formerly given by the British Guarantee Society (dissolved in 1862), which had formed the subject of so much correspondence and of many reports from this Board to your Lordships, may be considered as finally and satisfactorily brought to a close.

All bonds of the British Guarantee Society given for officers in this Department that were outstanding at the time of the dissolution of that Society, have long been replaced by fresh security. Moreover, your Lordships, by directing an inspection of the books of that Society, satisfied yourselves that the arrangements entered into between them and the European Assurance Company were sufficient to guarantee the Crown from all risk, provided a sum of 10,000*l.* were retained for a time out of the capital of the British Guarantee Society to meet any possible case of default. It having also been elicited by competent legal authority that the European Assu-

rance Company is empowered to guarantee the integrity of accountants of any description, and that their present position and prospects are such as to warrant the acceptance of increased responsibility, your Lordships finally decided on the 27th January to take their security generally for all persons other than officers of the Crown, on condition that the guarantee be in each case limited to 5,000*l.* as long as the reserved fund fixed by the Society's Act is under 50,000*l.* This decision was transmitted to us on the 26th March, together with your authority for taking these bonds in future on such conditions for lightermen, carmen, warehouse keepers, wharfingers, and all other such persons who give security to the Crown. The number of these bonds accepted since the settlement of this question has been 143. On the other hand, but three Customs officers have tendered as security bonds of the European Association. This is owing to the very superior advantages held out to the officers by the Customs Mutual Guarantee Society, established in 1857, the principle of which was explained to your Lordships in our Annual Report for 1858. We there stated the number of subscribers to this Association up to May 1858 to be 449, and their united guarantees to amount to 227,700*l.* The subscribers now number 1,211, and the amount of their united guarantees is 671,500*l.*, out of a total sum required by the Crown as security from this Department of about 830,000*l.*

Customs Guarantee Society.

Customs 2nd Report, pages 34 and 35.

Smuggling.

No organized attempt at smuggling on a large scale has come to our knowledge in 1864, nor have the Coast Guard reported to us that any run of spirits or tobacco has been made or attempted on any part of the coasts, or that any tubs have been found floating, or picked up on shore. Smuggling is, we consider, now almost entirely confined to the concealment of spirits and tobacco on board vessels in small quantities. There have been four cases of this description in the course of the year, in which the quantities of tobacco seized exceeded 100 lbs., viz., one in March of 105 lbs., on board a vessel at Liverpool, one in May, of 118 lbs., at Shields, one in July, of 200½ lbs., at Sunderland, and a fourth at Ardrossan, in the same month, of 110 lbs. In all these cases the guilty parties (in two of the four instances the masters of the vessels) were convicted, and either paid the penalty or were committed to prison in default.

Medical inspector's report.

We annex the annual report of Dr. Dickson, our

Medical Inspector, and beg to draw particular attention to that part of it (page 97) where he speaks of the practice of malingering or simulating sickness, and dwells upon the effect produced upon the force of out-door officers under his charge, in that respect, by the concession made to them last April by your Lordships in commuting their day pay into salary. We think it right to add, though Dr. Dickson has not mentioned it, that the increased necessity for vigilant supervision and for additional domiciliary visits caused by the tendency to simulate sickness, which he describes, has added much to the labours of Dr. Dickson during the year, and we are satisfied that had it not been for the zeal and energy shown by Dr. Dickson in the execution of his duties, the sick list would have been swelled by such delinquencies to a far greater amount.

The general results collected from Dr. Dickson's report may be summed up as follows, and compared with 1863.

The average daily number of men upon the sick list out of 1,149 officers (taking the London and the Gravesend force together) has been 37 or 3·2 per cent., as compared with one of 29 or 2·5 per cent. in 1863.

The ratio of admissions to the sick list to the whole force has been 87 per cent., as compared with 73 per cent. in 1863.

The mean duration of each case has been 13·3 days as against 12·6 days.

The time lost to the public service through sickness has been,—

11·7 days per man, as against
9·3 „ „ in 1863.

So far the return appears not so favourable as the one forwarded last year. But, notwithstanding this increase of sickness in the force from various causes, as explained by Dr. Dickson, the number of deaths were only 12 out of the whole force, or 1 per cent. against 13, or 1·13 per cent. in 1863.

Nor is this the most favourable view of the report for 1864. The deaths in 1863 (13) were all from disease, whereas out of the 12 deaths in 1864, no less than three were from accident, reducing the percentage of deaths by disease to less than 8 per 1,000 of strength, whereas in 1863 they numbered 11 per 1,000.

The superannuations have been only three, giving the proportion of 2·6 per 1,000, precisely the same ratio as that for 1863.

We have the honour to be,
My Lords,
Your Lordships' obedient servants,

Thos. F. Fremantle.
Frederick Goulburn.
Grenville C. L. Berkeley.
R. W. Grey.
Frederick Romilly.

Custom House, 1865.

APPENDIX.

APPENDIX (A.)

AN ACCOUNT showing the Amount of the Imports into and the Exports from the United Kingdom, stated in Real Value, in each Year from 1854 to 1864 inclusive.

YEARS.	Real Value.			
	Imports.	Exports.		
		Produce and Manufactures of the United Kingdom.	Foreign and Colonial Merchandise.	Total Exports.
	£	£	£	£
1854 - -	152,389,053	97,184,726	18,636,366	115,821,092
1855 - -	143,542,850	95,688,085	21,003,215	116,691,300
1856 - -	172,544,154	115,826,948	23,393,405	139,220,353
1857 - -	187,844,441	122,066,107	24,108,194	146,174,301
1858 - -	164,583,832	116,608,756	23,174,023	139,782,779
1859 - -	179,182,355	130,411,529	25,281,446	155,692,975
1860 - -	210,530,873	135,891,227	28,630,124	164,521,351
1861 - -	217,485,024	125,102,814	34,529,684	159,632,498
1862 - -	225,716,976	123,992,264	42,175,870	166,168,134
1863 - -	248,919,020	146,602,342	50,300,067	196,902,409
1864 - -	274,863,924	160,436,302	52,240,240	212,676,542

Office of the Inspector General of Imports and Exports,
Custom House, London, 31 March 1865.

JOHN A. MESSENGER.

APPENDIX (B.)

GENERAL SUMMARY showing the Gross Amount of Duty collected by the Customs at London, Liverpool, and the other Ports of England (exclusive of the Isle of Man), and at the Ports of Scotland and Ireland respectively, in the Years ended 31st December 1863 and 1864, specifying the Increase or Decrease; also the total Number of Officers on the Establishment: the Gross Amount paid on Account of Salaries and Day Pay; and the Total Expense incurred for Extra and Glut Aid in the same Years.

PORTS.	AMOUNT OF DUTY.				ESTABLISHMENT.								CHARGE FOR EXTRA AID.			
	Gross Amount of Duty collected.		In-crease.	De-crease.	Number of Officers.		In-crease.	De-crease.	Salaries and Day Pay.		In-crease.	De-crease.	Expense incurred for Glut and Extra Aid.		In-crease.	De-crease.
	1863.	1864.			1863.	1864.			1863.	1864.			1863.	1864.		
	£	£	£	£					£	£	£	£	£	£	£	£
LONDON - - -	11,974,397	11,491,412	- -	482,985	2,065	2,065	- -	- -	287,948	296,963	9,015	- -	14,356	15,470	1,114	- -
LIVERPOOL - -	3,183,401	2,593,445	- -	289,956	867	867	- -	- -	86,572	87,930	1,358	- -	3,641	4,440	799	- -
Other Ports in ENGLAND	3,278,561	3,289,202	- -	89,359	1,573	1,617	44	- -	148,225	154,690	6,465	- -	14,241	15,709	1,468	- -
Ports in SCOTLAND -	3,047,974	2,528,527	- -	221,147	536	544	8	- -	51,558	53,600	2,042	- -	4,920	4,777	- -	143
Ports in IRELAND -	2,154,599	2,047,524	- -	107,275	379	375	- -	4	40,420	40,661	241	- -	2,928	2,214	- -	714
TOTAL - -	23,588,932	22,498,210	- -	1,090,722	5,420	5,468	52	4	614,723	633,844	19,121	- -	40,086	42,610	3,381	857
NET INCREASE OR DE-CREASE - - -	- -	- -	- -	1,090,722	- -	- -	48	- -	- -	- -	19,121	- -	- -	- -	2,524	—

APPENDIX (C.)

RETURN showing the Gross Amount of Customs Duties collected at the several Ports of the United Kingdom for the Years ended 31st December 1863 and 1864, specifying the Articles upon which any Increase or Decrease has taken place.

ENGLAND.

PORT.	Amount of Duty. 1863.	Amount of Duty. 1864.	Increase.	Decrease.	Articles. Increase.	Articles. Decrease.	REMARKS.
	£	£	£	£			Vessels Inwards. Number. Tonnage. 1863 - - 11,608 - 3,441,519 1864 - - 11,206 - 3,359,782 Decrease - 402 Decrease 81,737
LONDON -	11,074,397	11,491,412	- -	482,985	Chicory, Spirits, Tobacco, Wine.	Coffee, Corn, Sugar, Tea.	Light Dues 1863 - - £57,574 1864 - - 56,254 Decrease - 1,320
							Pilotage 1863 - - £48,086 1864 - - 45,325 Decrease - 3,661
LIVERPOOL	3,133,401	2,894,001	- -	239,400	Spirits - Wine -	Corn, Sugar, Molasses, Tea.	There is a falling off of 240,000*l.* on sugar and molasses, caused by the reduction of duty.
ABERYSTWITH	653	654	1	—	—	—	
BARNSTAPLE -	7,671	7,533	- -	138	- - -	Tea - -	The falling off is entirely on tea.
BEAUMARIS -	862	918	56	- -	Wheat -	- - -	A cargo of wheat and flour was imported from North America.
BERWICK -	8,916	8,578	- -	338	Coffee, Geneva.	Grain, Tea.	There is a falling off of nearly 430*l.* on tea alone.
BIDEFORD -	3,573	3,878	305	- -	Wood, Coffee, Spirits, Wine.	Tea.	
BOSTON -	40,031	36,925	- -	3,106	Tea, Spirits, Wood.	Tobacco, Corn, Wine.	There is a falling off of 3,400*l.* on tobacco, the merchants having removed large quantities duty paid from London and Liverpool.
BRADFORD -	44,031	46,803	2,772	- -	Tobacco, Brandy.	Coffee, Fruit, Tea, Wine.	The trade in tobacco continues to increase.
BRIDGWATER	7,794	7,222	- -	572	Spirits, Wine, Wood.	Tea, Corn.	The decrease is almost entirely caused by the reduction of the tea duty.
BRIDPORT -	2,760	2,846	86	- -	Spirits -	- - -	

PALL MALL

Appendix (C.)—England—*continued.*

Port.	Amount of Duty. 1863.	Amount of Duty. 1864.	Increase.	Decrease.	Articles. Increase.	Articles. Decrease.	Remarks.
Bristol	£ 1,150,598	£ 1,103,000	£ -	£ 47,598	Wine, Spirits, Wood.	Fruit, Grain, Sugar, Tobacco.	There is a falling off of nearly 45,000*l.* caused by the reduction of duty on sugar.
Cardiff	13,132	12,785	-	347	Sugar	Corn, Flour.	There is a falling off of 1,400*l.* on corn and flour, and an increase of 1,000*l.* on refined sugar imported as a speculation.
Cardigan	53	59	6	—	—	—	———
Carlisle	28,302	27,477	-	825	-	Tobacco	One firm has discontinued the manufacture of tobacco.
Carnarvon	10,359	10,480	121	-	Rum	-	The increase is entirely on rum.
Castletown	1,514	3,611	2,097	-	-	-	Castletown, formerly under Douglas, became an independent port on the 1st September 1863.
Chepstow	4,454	4,731	277	-	Spirits	-	The trade of the port is on the increase.
Chester	67,387	76,350	8,963	-	Wine, Spirits, Tobacco.	-	The manufacturing trade of this part of the country is in a flourishing condition.
Colchester	14,549	14,150	-	399	-	Tea, Corn.	The falling off is principally on tea, caused by the reduction of duty.
Cowes	2,922	3,397	475	-	Rum, Wine, Sugar.	Brandy.	———
Dartmouth	3,555	3,746	191	-	Spirits	-	There is no material change in the trade of the port.
Deal	2,769	2,123	-	646	-	Corn, Spirits.	Duty was paid at this port in 1863 on a large quantity of wrecked spirits.
Douglas	26,273	25,383	-	890	Tobacco, Brandy, Wine.	Tea, Sugar, Rum, Geneva.	There was a decrease in the number of visitors during the year 1864.
Dover	8,112	7,814	-	298	-	Timber.	———
Exeter	118,084	123,373	5,289	-	Tobacco, Wine, Spirits.	-	A large tobacco firm has considerably increased its business, and paid 64,400*l.* duty during the last year.
Falmouth	6,533	6,336	-	197	Wood, Brandy.	Corn, Tea, Rum.	———
Faversham	1,415	1,466	51	—	—	—	———
Fleetwood	2,408	2,195	-	213	Corn	Timber	The trade of the port is in rather a depressed condition.
Folkestone	12,921	14,278	1,357	-	Wine	-	The importation of French wine has considerably increased.
Fowey	1,418	1,568	150	-	Timber, Brandy.	Tea, Rum.	———
Gainsboro'	9,865	9,471	-	394	-	-	The trade of the port has decreased in consequence of a railway bridge over the Trent.
Gloucester	69,935	63,672	-	6,263	Wine, Brandy, Timber.	Tea. Corn.	There is a decrease of upwards of 9,000*l.* on corn alone.
Goole	96,226	60,522	-	35,704	-	Sugar, Tea, Wine, Spirits.	The revenue received in 1862 and 1863 was quite exceptional.

Appendix (C.)—England—*continued.*

Port.	Amount of Duty. 1863.	Amount of Duty. 1864.	Increase.	Decrease.	Articles. Increase.	Articles. Decrease.	Remarks.
	£	£	£	£			
Grimsby	33,847	19,209	-	14,580	Timber.	Sugar, Corn.	The trade of the port is on the increase notwithstanding the falling off in the revenue.
Halifax	8,244	10,090	1,846	-	Wines, Spirits.	-	The trade of this inland bonding town is gradually on the increase.
Hartlepool	28,981	32,332	3,351	-	Timber, Refined sugar.	-	
Harwich	1,349	2,443	1,094	-	Sugar, Wine, Tobacco.	-	The trade established by the Great Eastern Railway Company is on the increase.
Hayle	-	1,228	-	-	-	-	Hayle, formerly a creek of Penzance, became an independent port on 1st October 1864.
Hull	240,133	291,256	51,123	-	Tobacco, Refined sugar.	-	The principal tobacco manufacturer has become tenant of the tobacco warehouse and paid duty at this port.
Ipswich	19,938	24,261	4,323	-	Corn, Wine, Spirits.	Tea	One of the wine and spirit merchants has paid duty at this port instead of in London.
Lancaster	17,019	16,722	-	297	-	Tea	The decrease is entirely owing to the reduction of duty on tea, the trade of the port being on the increase.
Leeds	1,773	29,169	-	-	-	-	Business commenced at this inland bonding town on the 2nd November 1863.
Littlehampton	822	1,306	484	-	Wine, Spirits.	-	The steam traffic at this port is gradually on the increase.
Llanelly	2,926	2,308	-	618	Rum.	Corn.	
Lowestoft	4,102	3,508	-	593	Wood.	Corn, Tea, Wine.	There is a loss of 300*l.* on corn and 200*l.* on tea.
Lyme	502	570	68	-	Wine.	—	
Lynn	15,777	9,834	-	5,943	Wine, Spirits.	Tobacco	The decrease is entirely owing to dissensions in the tobacco trade.
Maldon	263	329	66	-	Corn.	—	
Manchester	160,103	144,171	-	15,932	Wine Spirits.	Tobacco, Tea, Sugar, Coffee.	There is a decrease of more than 12,000*l.* on sugar alone.
Maryport	5,383	3,890	-	1,493	-	Tea	One of the principal tea dealers has ceased to bond at this port.
Middlesboro'	2,158	2,711	553	-	Timber, Spirits, Tea.	—	
Milford	655	446	-	209	-	Timber.	
Newcastle	217,903	214,415	-	3,488	Rum, Sugar, Brandy, Wood.	Tobacco, Tea, Coffee.	There is a decrease of 10,000*l.* on tobacco in consequence of that article being removed duty-paid from other ports.
Newhaven	5,588	5,682	94	-	Wine.	—	
Newport	13,691	13,882	191	-	Spirits.	Tea, Wood, Corn.	
Padstow	186	139	-	47	-	Grain	A cargo of grain paid duty at this port in 1863.
Penzance	12,150	9,619	-	2,531	Spirits	Corn, Fruit. Wood. Tea.	The decrease is in a great measure owing to Hayle, formerly a creek, having been made an independent port.
Plymouth	181,190	183,721	2,531	-	Brandy, Sugar. Wood,	Wine, Grain, Tea, Fruit.	

Appendix (C.)—England—*continued.*

Port.	Amount of Duty. 1863.	Amount of Duty. 1864.	Increase.	Decrease.	Articles. Increase.	Articles. Decrease.	Remarks.
	£	£	£	£			
Poole	5,634	4,464	-	1,170	Wood, Brandy, Wine.	Grain	There is a decrease of 1,700*l.* on grain alone.
Portsmouth	22,478	21,978	-	500	-	Timber, Tea.	There is a decrease of nearly 300*l.* on tea caused by the reduction of duty.
Preston	68,598	67,913	-	685	Spirits	Tea, Tobacco,	There is an increase of upwards of 3,000*l.* on rum.
Ramsey	5,228	5,191	-	37	Brandy, Geneva.	Rum, Tea, Tobacco.	—
Ramsgate	2,944	3,989	1,045	-	Sugar, Coffee, (damaged).	-	A damaged cargo of sugar and coffee paid duty at this port.
Rochester	6,081	9,149	3,068	-	Refined sugar. Spirits.	Corn. Tea.	Upwards of 3,000*l.* was paid on refined sugar from France and Holland.
Runcorn	3,438	2,410	-	970	-	Flour.	—
Rye	463	357	-	106	-	Timber	In 1863 duty was paid on a quantity of wrecked goods.
Scarborough	3,433	3,407	-	26	—	—	—
Scilly	52	26	-	26	—	—	—
Shields	40,255	45,900	5,645	-	Spirits, Tea, Timber.	Tobacco	There is an increase of 4,500*l.* on spirits.
Shoreham	8,284	6,071	-	2,213	Wine Timber.	Sugar, Spirits, Corn.	The decrease in the revenue is principally caused by the reduction of duty on sugar.
Southampton	107,598	84,104	-	23,494	-	Tobacco, Sugar.	A large importer of tobacco from Guernsey has closed his premises and a sugar refinery has been given up.
Stockton	75,036	79,735	4,699	-	Wine, Spirits, Sugar, Tobacco.	Corn, Tea, Coffee.	—
Sunderland	86,386	86,435	49	—	—	—	—
Swansea	8,731	8,049	-	682	-	Timber	The railways in the Vale of Neath being now completed the importation of timber has considerably diminished.
Teignmouth	663	1,751	1,088	-	Rum, Brandy, Wine.	-	The number of merchants bonding at this port has increased.
Truro	11,559	11,221	-	338	-	Tea	The decrease is caused by the reduction of duty on tea.
Wells	122	80	-	42	-	Corn.	—
Weymouth	9,647	9,707	60	-	Wood.	—	—
Whitby	5,580	5,497	-	83	Brandy, Rum, Wine.	Tea	There is a decrease of 775*l.* on tea and an increase of 555*l.* on rum.
Whitehaven	64,237	68,244	4,007	-	Tobacco, Spirits.	Corn, Sugar.	The increase on tobacco alone amounts to 4,600*l.*
Wisbeach	3,956	3,598	-	358	-	Wood.	—
Woodbridge	659	633	-	26	-	Wine, Spirits.	—
Workington	2,470	3,095	625	-	Tea	-	The trade of this port continues to increase.
Yarmouth	24,005	23,787	-	218	Brandy, Wine,	Corn, Rum.	—

Appendix (C.)—Scotland.

Port.	Amount of Duty		Increase.	Decrease.	Articles.		Remarks.
	1863.	1864.			Increase.	Decrease.	
	£	£	£	£			
BERDEEN	82,838	89,056	6,218	- -	Tobacco -	- - -	An additional tobacco manufacturer has commenced business at this port.
LLOA - -	6,987	6,544	- -	443	- - -	Corn, Wood.	
RBROATH -	14,245	15,540	1,304	- -	Tobacco -	- - -	The increase in the consumption of tobacco is accounted for by the prosperous state of the linen trade.
RDROSSAN -	673	705	92	- -	- - -	- - -	Ardrossan was made an independent port on the 1st July 1863.
YR - -	2,874	2,711	- -	163	- - -	Grain, Timber.	
ANFF - -	3,338	2,921	- -	417	- - -	Tea, Tobacco, Wine.	The decrease is principally caused by the reduction of the tea duty.
ORROWSTO-NESS.	567	720	153	- -	Timber, Corn.	—	
AMPBELTOWN	1,029	914	- -	115	- - -	Barley -	
UMFRIES -	6,451	6,524	73	- -	Tea.	—	
UNDEE - -	65,049	72,801	7,752	- -	Tea, Spirits.	- - -	The year 1864 has been one of unexampled prosperity in this neighbourhood.
LASGOW -	979,950	964,477	- -	15,473	- - -	Sugar -	The decrease on sugar is caused by the failure of a refinery.
RANGEMOUTH	15,340	12,603	- -	2,737	Wood -	Corn -	The decrease in corn is attributed to the blockade of the Prussian ports during the early part of the year.
REENOCK -	1,231,124	1,054,836	- -	176,288	-	Sugar -	The decrease is entirely caused by the reduction of the duty.
NVERNESS -	5,744	5,113	- -	631	Brandy, Wine.	Corn, Tea, Rum.	
IRKCALDY -	10,704	16,435	5,671	- -	Tobacco -	- - -	A large quantity of tobacco has been duty paid.
IRKWALL -	114	64	- -	50	- - -	Timber -	
EITH - -	430,706	431,610	- -	8,096	Spirits, Tea, Wine.	Tobacco, Sugar.	
ERWICK -	124	86	- -	38	- - -	- - -	In 1863 duty was paid on some wrecked goods.
ONTROSE -	14,919	9,788	- -	5,131	Timber -	Tobacco -	Tobacco has ceased to be warehoused at this port.
ERTH - -	15,581	16,308	727	- -	Tea, Coffee, Tobacco, Rum.	—	
ETERHEAD -	2,235	1,969	- -	266	- - -	Tea -	The trade of the port has fallen off in consequence of fewer vessels being employed in the whale fisheries.
ORT GLASGOW	140,174	106,925	- -	33,249	- - -	Sugar -	The decrease is caused by the reduction of the duty.
ORNOWAY -	62	39	- -	23	- - -	Timber.	
RANRAER -	309	118	- -	191	- - -	- - -	In 1863 duty was paid on the cargo of a stranded vessel.
ROON - -	3,627	6,908	3,281	- -	Timber, Tobacco.	- - -	Troon became an independent port on 1st July 1863.
ICK -	896	995	99	- -	Tea, Spirits.	Corn -	
IGTOWN -	23	45	22	—	—	—	

Appendix (C.)—Ireland.

Port.	Amount of Duty. 1863.	Amount of Duty. 1864.	Increase.	Decrease.	Articles. Increase.	Articles. Decrease.	Remarks.
Ballina	£ 3,154	£ 2,210	- -	£ 944	- - -	Corn -	The importation of corn has completely ceased.
Belfast	349,902	330,277	- -	19,625	Spirits, Sugar, Wine, Timber.	Corn, Tea, Tobacco.	There is a decrease of nearly 19,000 on tobacco.
Coleraine	6,167	6,444	277	- -	Spirits -	Tea.	———
Cork	302,559	293,291	- -	9,268	Tea, Tobacco.	Grain -	There is a decrease of 11,500*l.* on grain.
Drogheda	4,404	4,151	- -	253	Timber, Corn.	Tea -	The decrease is caused by the reduction of duty on tea.
Dublin	965,812	940,912	- -	24,900	Tobacco, Wine, Spirits.	Tea, Sugar.	The decrease on sugar alone amounts to 32,200*l.*
Dundalk	39,313	40,009	696	- -	Spirits, Tobacco.	Corn, Timber, Tea, Wine.	———
Galway	23,372	20,389	- -	2,983	Tobacco -	Sugar, Tea, Wood, Corn.	There is a good deal of distress in the neighbourhood.
Limerick	153,797	138,204	- -	15,593	- - -	Corn, Sugar, Tobacco.	The trade of this port yearly declines.
Londonderry	116,645	104,348	- -	12,297	Wine, Brandy.	Corn, Wood, Tobacco, Rum.	The trade is in a very dull and inactive state.
Newry	22,475	21,694	- -	781	- - -	Corn, Tea.	———
Ross	20,549	19,523	- -	1,026	Tobacco, Tea.	Corn -	There is a decrease of upwards of 2,200*l.* on corn.
Skibbereen	1,824	1,157	- -	667	- - -	Corn, Tea.	The decrease on corn amounts to more than 500*l.*
Sligo	28,461	26,515	- -	1,946	Tobacco, Wine.	Corn, Tea, Rum.	———
Strangford	95	169	74	- -	Timber.	—	———
Thalen	18,791	16,556	- -	2,235	Tea, Tobacco, Wine.	Corn -	The decrease is confined to corn.
Waterford	80,233	66,122	- -	14,111	Spirits -	Corn, Tobacco, Tea.	———
Westport	3,078	1,542	- -	1,356	- - -	Corn, Tobacco.	———
Wexford	14,069	13,840	- -	229	- - -	Tea -	The decrease is caused by the reduction of duty on tea.

APPENDIX (D.)

A STATEMENT showing the Alterations which have taken place in the Customs Tariff during the Year 1864, and showing, also, the Authority under which each of those Alterations has been carried into effect.

ARTICLES.	Rates of Duty chargeable at the commencement of the Year 1864.	Rates of Duty substituted in the Year 1864.	Authority by which the Alterations were made, and dates from which they severally took place.
	£ s. d.	£ s. d.	
Sugar, refined, and Candy -	0 18 4 per cwt.	0 12 10 per cwt.	27 Vict. c. 18.—5th May 1864.
Sugar, unrefined:			
White clayed, or equal thereto	0 16 0 per cwt.	0 11 8 per cwt.	
Yellow Muscovado and brown clayed, or equal thereto -	0 13 10 per cwt.	0 10 6 per cwt.	
Brown Muscovado, or equal thereto - - -	0 12 8 per cwt.	0 9 4 per cwt.	
Not equal to brown Muscovado	0 12 8 per cwt.	0 8 2 per cwt.	
Molasses - - -	0 5 0 per cwt.	0 3 6 per cwt.	
Sugar Cane Juice - -	0 10 4 per cwt.	0 6 7 per cwt.	
Almond Paste - - -			27 Vict. c. 18.—16th April 1864.
Cherries, dried - -			
Comfits, dry - - -			
Confectionery, not otherwise enumerated - -			
Ginger, preserved - -	0 0 2 per lb.	0 0 1 per lb.	
Marmalade - - -			
Plums, preserved in Sugar -			
Succades, including all Fruits and Vegetables preserved in Sugar - - -			
Corn and Grain of all sorts -	0 1 0 per qr.	0 0 3 per cwt.	27 Vict. c. 18.—1st September 1864.

Office of the Inspector General of Imports and Exports,
Custom House, London, 22nd March 1865.

JOHN A. MESSENGER.

APPENDIX (E.)

AN ACCOUNT of the Gross Receipt of Customs Duties in the United Kingdom in the Year 1864, compared with the Receipt in the preceding Year 1863; specifying the Amount collected on each of the principal Articles: Also, of the aggregate Amount paid for Drawbacks, Allowances for Goods over-entered, &c.; and of the aggregate Net Receipt of Customs Duties in the same Years.

—	Years ended 31st December		Increase or Decrease in the Year 1864, as compared with the Year 1863.	
	1863.	1864.	Increase.	Decrease.
	£	£	£	£
Chicory	64,220	129,104	64,884	—
Coffee	412,331	394,898	—	17,433
Corn	795,509	625,236	—	170,273
Currants	268,950	260,069	—	8,881
Figs, Plums, and Prunes	38,548	30,697	—	7,851
Pepper	116,535	120,425	3,890	—
Raisins	109,202	102,947	—	6,255
Spirits: Rum	1,738,399	1,896,085	157,686	—
„ Brandy	998,057	1,205,707	207,650	—
„ Geneva and other sorts	130,592	139,433	8,841	—
Sugar	6,565,002	5,311,986	—	1,253,016
„ Molasses	157,369	90,520	—	66,849
Tea	4,652,822	4,431,868	—	220,954
Tobacco and Snuff	5,986,445	6,091,759	105,314	—
Wine	1,214,713	1,319,267	104,554	—
Wood: Sawn or Split	189,468	198,506	9,038	—
„ Not Sawn or Split	72,632	73,549	917	—
Other Articles (taken collectively)	78,138	76,154	—	1,984
AGGREGATE GROSS RECEIPT	23,588,932	22,498,210	—	1,090,722
Deduct Drawbacks and Repayments	371,295	204,707	—	166,588
AGGREGATE NET RECEIPT	23,217,637	22,293,503	—	924,134

Office of the Inspector General of Imports and Exports,
Custom House, London, 22nd March 1865.

JOHN A. MESSENGER.

APPENDIX (F.)

AN ACCOUNT showing, in Quarterly and Annual Periods, the Net Receipt of Customs Duties in the United Kingdom in the Years 1863 and 1864, specifying the Receipt upon each of the principal Articles; and showing also, the Increase or Decrease in the Receipt of the Year 1864, as compared with the Receipt in the Year preceding.

	NET RECEIPT OF CUSTOMS DUTIES IN THE YEARS 1863 AND 1864.											
	Quarters ended				Year ended 31st Dec.	Quarters ended				Year ended 31st Dec.	Increase or Decrease in the Year 1864, as compared with the Year 1863.	
	31st March 1863.	30th June 1863.	30th Sept. 1863.	31st Dec. 1863.	1863.	31st March 1864.	30th June 1864.	30th Sept. 1864.	31st Dec. 1864.	1864.	Increase.	Decrease.
	£	£	£	£	£	£	£	£	£	£	£	£
Chicory	15,746	35,282	748	12,070	63,846	34,864	29,121	33,303	31,466	128,754	64,908	—
Coffee	105,368	103,451	98,719	102,141	409,679	106,392	94,654	94,701	96,425	392,172	- - -	17,507
Corn	184,612	182,945	236,226	184,615	788,398	142,576	113,713	200,140	162,739	619,168	- - -	169,230
Currants	42,161	49,308	55,733	121,118	268,383	37,546	58,346	45,813	117,874	259,579	- - -	8,804
Figs, Plums, and Prunes	7,930	6,537	2,042	21,774	38,283	8,363	4,395	2,324	15,331	30,413	- - -	7,870
Pepper	29,313	23,353	30,434	33,272	116,372	24,650	34,033	27,321	34,356	120,360	3,988	—
Raisins	11,855	10,318	18,054	68,480	108,707	9,743	11,150	17,896	63,492	102,281	- - -	6,426
Spirits, Rum	461,145	371,637	358,773	546,467	1,738,022	548,264	399,351	377,772	570,203	1,895,590	157,568	—
—— Brandy	225,363	224,001	261,982	285,767	997,113	269,027	271,726	321,472	342,280	1,204,505	207,392	—
—— Geneva, and other Sorts	34,157	33,823	27,853	34,398	130,236	31,390	30,196	37,770	39,799	139,155	8,919	—
Sugar	1,434,703	1,644,999	1,713,334	1,431,943	6,254,979	1,224,517	1,407,230	1,267,565	1,265,790	5,165,102	- - -	1,089,877
—— Molasses	34,151	45,738	40,495	35,325	155,709	22,348	21,512	23,046	23,012	89,918	- - -	65,791
Tea	1,210,552	1,285,584	1,096,701	1,058,658	4,651,495	1,113,532	1,113,299	1,104,539	1,098,623	4,429,993	- - -	221,502
Tobacco and Snuff	1,501,142	1,427,755	1,487,436	1,533,834	5,950,167	1,534,985	1,457,937	1,506,635	1,555,872	6,055,429	105,262	—
Wine	289,636	303,380	286,689	333,217	1,212,922	319,129	344,043	315,875	338,597	1,317,644	104,722	—
Wood, Sawn or Split	15,116	29,924	75,826	64,395	185,261	21,964	24,635	82,358	65,677	194,634	9,373	—
—— Not Sawn or Split	4,651	10,848	31,298	24,169	70,966	8,086	8,417	27,563	28,480	72,546	1,580	—
Other Articles (taken collectively)	16,291	18,557	23,375	18,876	77,099	18,357	19,423	17,141	21,339	76,260	- - -	839
AGGREGATE RECEIPT	5,653,892	5,807,445	5,845,718	5,910,582	23,217,637	5,475,733	5,443,181	5,503,234	5,871,355	22,293,503	—	924,134

Office of the Inspector General of Imports and Exports,
Custom House, London, 22nd March 1865.

JOHN A. MESSENGER.

APPENDIX (G.)

A STATEMENT showing the Gross Receipt and Net Produce of the Customs Revenue of the United Kingdom in each Financial Year from 1858 to 1864, inclusive, with the Charges of Collection thereon, and the Rate per Cent. of Collection on the Gross Receipt and Net Produce respectively.

CUSTOMS REVENUE of the UNITED KINGDOM.

Year ending 31st March.	Gross Receipt.	Net Produce after deducting Drawbacks, Bounties, Repayments or Over-entries, &c.	Charges of Collection.	Rate per Cent. of Collection.	
				On the Gross Receipt.	On the Net Produce.
	£	£	£	£ s. d.	£ s. d.
1858 -	23,603,770	23,275,743	843,757	3 11 6	3 12 6
1859 -	24,376,169	23,998,380	838,203	3 8 9	3 9 10
1860 -	24,789,793	24,391,084	823,284	3 6 5	3 7 6
1861 -	23,516,821	23,278,250	769,663	3 5 5	3 6 1
1862 -	23,937,772	23,692,955	733,208	3 1 3	3 1 11
1863 -	24,339,083	24,038,893	726,517	2 19 8	3 0 5
1864 -	23,569,101	23,234,356	741,791	3 2 11	3 3 10

Office of the Inspector General of Imports and Exports,
Custom House, London, 22nd March 1865.

JOHN A. MESSENGER.

APPENDIX (H.)

AN ACCOUNT showing the Quantities of Raw Cotton imported into the United Kingdom in the Year 1864, distinguishing the Countries from which imported.

Countries from which imported.	Quantities of Cotton Wool imported into the United Kingdom in the Year 1864.
	Cwts.
Russia: Ports within the Baltic	346
Sweden: Ports within the Baltic	20
Norway	81
Denmark	724
Prussia	1,100
Hamburg	1,755
Bremen	4,233
Holland	761
Belgium	1,899
France: Ports without the Mediterranean	46,333
Ports within the Mediterranean	1,236
Portugal	3,756
Spain: Ports within the Mediterranean	14,510
Gibraltar	21
Italy: Genoa	656
Tuscany	227
Naples	166
Sicily	975
Venetia	159
Illyria, Croatia, and Dalmatia	654
Malta	2,222
Ionian Islands	196
Greece	3,800
Turkey, European	19,130
Natolia or Asia Minor	132,160
Syria and Palestine	17,944
Egypt	1,120,479
Africa: Morocco	47
British Possessions on the River Gambia	178
Sierra Leone	33
British Possessions on the Gold Coast	739
West Coast, not particularly designated	54
Cape of Good Hope	1,362
Natal	345
St. Helena	27
Mauritius	830
British India: Bombay	3,573,048
Madras	421,833
Bengal	489,420
Singapore	5,766
Ceylon	32,499
French Possessions in India	2,413
Philippine Islands	20
China	459,847
Hong Kong	309,412

APPENDIX (H.)—*continued.*

Countries from which imported.		Quantities of Cotton Wool imported into the United Kingdom in the Year 1864.
		Cwts.
Japan		83,967
West Australia		3
South Australia		159
Victoria		186
New South Wales		393
Queensland		200
Canada		1,966
New Brunswick		15
Nova Scotia		9,144
Bermudas		148,233
Bahamas		227,814
British West India Islands (except Bahamas):	Jamaica	4,654
	St. Christopher	182
	Nevis	1
	Antigua	119
	Montserrat	15
	Dominica	1
	St. Lucia	154
	St. Vincent	217
	Barbadoes	1,200
	Grenada	1,382
	Tobago	161
	Trinidad	500
British Guiana:	Demerara	2,238
	Berbice	98
Belize		6,219
Foreign West Indies:	Cuba	43,035
	Porto Rico	2,689
	Curaçoa	111
	St. Thomas	1,058
	Dutch Guiana	338
	Hayti and St. Domingo	13,476
United States of America:	Ports on the Atlantic, Northern	118,214
	Southern	8,108
Mexico:	Ports on the Atlantic	227,854
	Ports on the Pacific	173
Central America:	Ports on the Atlantic	175
	Ports on the Pacific	197
New Granada:	Ports on the Atlantic	46,065
Venezuela		11,974
Ecuador		117
Peru		64
Chili		12
Brazil		339,442
Uruguay		190
Argentine Confederation		6
	Total	7,975,935

Office of the Inspector General of Imports and Exports,
Custom House, London, 22nd March 1865.

JOHN A. MESSENGER.

APPENDIX (I.)

AN ACCOUNT of the computed Real Value of the Imports and Exports of Gold and Silver Bullion and Specie registered in the year ended 31st December 1864.

Countries from which Imported.	Imported into the United Kingdom.			Exported from the United Kingdom.		
	Gold.	Silver.	Total.	Gold.	Silver.	Total.
	£	£	£	£	£	£
Russia	50,530	3,330	53,860	—	289	289
Denmark	64	59,747	59,811	—	107,734	107,734
Hanse Towns	208,090	648,253	856,343	46,572	202,423	248,995
Holland	2,252	437,745	439,997	4,108	539,103	543,211
Belgium	10,282	1,185,259	1,195,541	30,353	234,944	265,297
France	573,913	1,115,096	1,689,009	7,775,111	2,146,413	9,921,524
Portugal, Azores, and Madeira	94,147	55,854	150,001	201,835	194	202,029
Spain and Canaries	11,548	5,857	17,405	1,385,900	26,824	1,412,724
Gibraltar	27,345	30,997	58,342	2,511	2,083	4,594
Malta	12,712	—	12,712	97,305	13,177	110,482
Turkey	2,129	—	2,129	23	10	33
Egypt	65,831	633	66,464	2,059,754	6,308,368	8,368,122
West Coast of Africa	96,078	24,408	120,486	29,842	26,780	56,622
British Possessions in South Africa	3,524	3,398	6,922	135,417	—	135,417
Australia	2,656,971	162	2,657,133	12	8,373	8,385
British Columbia	11,946	107	12,053	—	—	—
British North American Provinces	110,447	11,991	122,438	185,164	15,457	200,621
Mexico, South America (except Brazil), and West Indies.	5,239,899	7,002,384	12,242,283	207,804	59,125	266,929
Brazil	180,996	69,928	250,924	926,944	142,706	1,069,650
United States of America	7,479,790	155,150	7,634,940	185,100	4,631	189,731
Other Countries	62,457	17,026	79,483	5,984	13,927	19,911
Total	16,900,951	10,827,325	27,728,276	13,279,739	9,852,561	23,132,300

Office of the Inspector General of Imports and Exports,
Custom House, London, 27th March 1865.

JOHN A. MESSENGER.

APPENDIX (K.)

Port of London.

A Statement showing the Number of Payments for Duties in Cash and Bank Notes, by Traders' Cheques upon Bankers, and by the Transfer or Customs Note; also, an Average Amount of the daily Receipts by each Mode of Payment; for the Years 1855, 1856, 1857, 1858, 1859, 1860, 1861, 1862, 1863, and 1864.

Date.	Total Number of Receipts.	Total Amount of the Year's Receipts.	No. of Payments made in Cash and Bank Notes.	Amount of Duty received in Cash and Bank Notes.	No. of Payments made by Exchequer Bills.	Amount of Duty received by Exchequer Bills.	No. of Payments made by Traders' Cheques.	Amount of Duty received by Traders' Cheques.	No. of Payments made by Customs Cheques.	Amount of Duty received by Customs Cheques.
From the 1st January to 31st December 1855 (being 309 secular days)	149,308	£ s. d. 11,737,525 5 2	104,957	£ s. d. 4,950,379 17 9	—	£ s. d. —	49,421	£ s. d. 3,522,484 11 2	14,930	£ s. d. 3,264,660 16 3
From the 1st January to 31st December 1856 (being 311 secular days)	163,407	12,330,497 7 4	106,921	3,709,566 10 10	—	—	33,337	3,627,737 10 3	23,149	4,993,193 7 3
From the 1st January to 31st December 1857 (being 309 secular days)	158,843	11,495,322 13 4	100,781	3,320,492 8 7	—	—	35,317	3,563,966 7 9	22,745	4,610,863 17 0
From the 1st January to 31st December 1858 (being 310 secular days)	159,174	12,350,437 0 6	99,274	3,066,550 12 2	—	—	34,217	3,363,285 1 8	25,683	5,020,601 6 8
From the 1st January to 31st December 1859 (being 310 secular days)	164,103	12,758,949 3 2	102,157	3,151,489 8 7	—	—	35,456	3,844,064 6 1	26,490	5,763,395 13 6
From the 1st January to 31st December 1860 (being 310 secular days)	149,492	11,823,975 0 6	89,928	2,385,491 19 2	—	—	33,694	3,630,734 11 5	25,870	5,807,748 9 11
From the 1st January to 31st December 1861 (being 310 secular days)	154,715	11,956,884 19 11	94,056	2,455,669 1 6	—	—	33,099	3,616,149 9 8	27,560	5,885,066 8 9
From the 1st January to 31st December 1862 (being 310 secular days)	153,851	12,199,131 14 4	92,320	2,152,725 4 6	—	—	33,804	3,790,574 16 7	27,727	6,255,831 13 3
From the 1st January to 31st December 1863 (being 309 secular days)	156,775	12,014,617 6 2	93,844	2,035,531 2 5	—	—	33,777	3,793,556 6 8	29,154	6,180,529 17 1
From the 1st January to 31st December 1864 (being 311 secular days)	162,948	11,537,587 18 1	97,085	2,080,000 17 2	170	307,585 8 0	33,407	3,050,577 18 8	32,286	6,099,423 14 3
Daily Average, 1855	483	37,986 0 0	340	16,021 0 0	—	—	95	11,400 0 0	*66	14,382 0 0
" " 1856	526	39,648 0 0	344	11,928 0 0	—	—	107	11,665 0 0	74	16,055 0 0
" " 1857	514	37,210 0 0	326	10,746 0 0	—	—	114	11,533 0 0	73	14,922 0 0
" " 1858	514	39,840 0 0	320	9,892 0 0	—	—	111	10,849 0 0	83	18,131 0 0
" " 1859	529	41,158 0 0	330	10,166 0 0	—	—	114	12,400 0 0	85	18,591 0 0
" " 1860	482	38,142 0 0	290	7,695 0 0	—	—	109	11,712 0 0	83	18,735 0 0
" " 1861	499	38,570 0 0	303	7,921 0 0	—	—	107	11,665 0 0	89	18,984 0 0
" " 1862	496	39,352 0 0	298	6,944 0 0	—	—	109	12,227 0 0	89	20,180 0 0
" " 1863	507	38,882 0 0	304	6,587 0 0	—	—	109	12,293 0 0	94	20,001 0 0
" " 1864	524	37,098 0 0	312	6,688 0 0	—	—	108	9,809 0 0	103	19,612 0 0
Average of each Receipt, 1855				47 2 5	—	—	—	120 0 0	—	217 18 2
" " 1856				34 13 6	—	—	—	109 0 0	—	216 19 4
" " 1857				32 19 0	—	—	—	101 3 4	—	204 8 2
" " 1858				30 18 0	—	—	—	97 14 8	—	218 16 10
" " 1859				30 17 0	—	—	—	108 9 0	—	217 11 3
" " 1860				26 10 6	—	—	—	107 15 0	—	224 10 0
" " 1861				26 2 0	—	—	—	109 5 0	—	213 7 0
" " 1862				23 6 0	—	—	—	112 3 6	—	225 15 0
" " 1863				21 13 10	—	—	—	112 9 3	—	212 0 0
" " 1864				21 8 6	—	1,809 0 0	—	91 6 3	—	188 18 4

* The Customs Cheque was first used on the 9th of April 1855, consequently it was in operation

APPENDIX (L.)

An Account of the Tonnage, distinguishing British from Foreign, entered Inwards and cleared Outwards during each year from 1854 to 1864, both inclusive.

Years.	Entered Inwards.			Cleared Outwards.			Total of Ships entered Inwards and Outwards.
	British.	Foreign.	Total.	British.	Foreign.	Total.	
	Tonnage.	Tonnage.	Tonnage.	Tonnage.	Tonnage.	Tonnage.	Tonnage.
1854 -	5,374,551	3,786,815	9,161,366	5,370,298	4,137,423	9,507,721	18,669,087
1855 -	,270,792	3,680,447	8,951,239	5,648,940	3,889,291	9,538,231	18,489,470
1856 -	6,390,715	4,162,419	10,553,134	6,555,056	4,480,859	11,035,915	21,589,049
1857 -	6,853,705	4,621,494	11,475,199	6,840,402	4,863,191	11,703,593	23,178,792
1858 -	6,439,201	4,522,499	10,961,700	6,452,204	4,896,077	11,348,281	22,309,981
1859 -	6,585,112	4,636,810	11,221,922	6,726,731	4,955,606	11,682,337	22,904,259
1860 -	6,889,009	5,283,776	12,172,785	7,025,914	5,490,593	12,516,507	24,689,292
1861 -	7,721,035	5,458,554	13,179,589	7,699,497	5,716,555	13,416,052	26,595,641
1862 -	7,856,639	5,234,451	13,091,090	8,090,221	5,354,128	13,444,349	26,535,439
1863 -	8,430,146	4,825,917	13,256,063	8,589,246	4,893,424	13,482,670	26,738,733
1864 -	9,028,100	4,486,911	13,515,011	9,173,575	4,515,923	13,689,498	27,204,509

15th April 1865.

W. WYBROW, Collector.

APPENDIX (M.)

Registered Tonnage of the British Empire.

Table 1.—New Vessels Built and Registered during each year from 1854 to 1864, both inclusive.

Year ending 5th January.	United Kingdom.		Channel Islands.		British Plantations.		Total in British Empire.	
	Vessels.	Tons.	Vessels.	Tons.	Vessels.	Tons.	Vessels.	Tons.
1854 -	798	203,171	32	4,067	723	152,550	1,553	359,788
1855 -	802	196,942	28	4,761	752	188,272	1,582	389,975
1856 -	1,098	323,200	28	3,894	744	164,968	1,870	492,062
1857 -	1,150	244,578	32	3,398	694	175,620	1,876	423,596
1858 -	1,278	250,472	46	5,065	721	167,940	2,045	423,477
1859 -	1,000	208,080	40	4,980	633	99,328	1,673	312,388
1860 -	959	185,970	31	3,041	605	93,307	1,575	282,318
1861 -	1,016	211,968	31	2,442	675	104,418	1,722	318,828
1862 -	1,186	310,900	38	3,927	699	136,707	1,923	451,534
1863 -	1,285	351,427	46	4,732	759	161,467	2,090	507,626
1864 -	1,514	626,756	38	4,018	1,237	340,424	2,789	971,198

15th April 1865.

W. WYBROW, Collector.

APPENDIX (N.)

Registered Tonnage of the British Empire.

Table 2.—Aggregate Number of Registered Vessels existing on the Registry in each year from 1854 to 1864, both inclusive.

Year ending 31st December.	United Kingdom.		Channel Islands.		British Plantations.		Total in British Empire.		
	Vessels.	Tons.	Vessels.	Tons.	Vessels.	Tons.	Vessels.	Tons.	Men.
1854 -	25,986	4,184,685	873	64,065	9,489	867,096	36,348	5,115,846	269,093
1855 -	25,115	4,286,908	833	62,426	9,744	901,219	35,692	5,250,553	261,194
1856 -	25,335	4,304,460	842	62,496	9,835	945,480	36,012	5,312,436	267,573
1857 -	26,219	4,491,377	878	67,363	9,991	973,147	37,088	5,531,887	287,353
1858 -	26,658	4,587,893	883	69,845	10,210	951,885	37,751	5,609,623	288,345
1859 -	26,804	4,591,250	898	71,941	10,498	997,211	38,200	5,660,402	291,431
1860 -	26,764	4,586,742	899	71,945	10,838	1,052,281	38,501	5,710,968	294,460
1861 -	27,142	4,735,491	896	71,335	10,830	1,088,543	38,868	5,895,369	299,861
1862 -	27,525	4,860,191	915	74,209	10,987	1,106,958	39,427	6,041,358	304,171
1863 -	27,750	5,251,757	887	76,316	11,558	1,296,330	40,195	6,624,403	326,366
1864 -	27,737	5,542,878	895	84,622	*11,012	1,215,961	39,644	6,843,461	327,941

* Several returns for 1864 not having been received, these accounts will be corrected next year.

15th April 1865.

W. WYBROW, Collector.

E

APPENDIX (O).—No. 1.

A STATEMENT showing the Declared Value of British and Irish Produce and Manufacture exported to the United States of America in the Years 1860, 1861, 1862, 1863, and 1864, specifying the Principal Articles.

Articles.	1860.	1861.	1862.	1863.	1864.	Increase or Decrease in 1864 as compared with 1863.		Increase or Decrease in 1864 as compared with 1860.	
						Increase.	Decrease.	Increase.	Decrease.
	£	£	£	£	£	£	£	£	£
Alkali, soda - -	526,806	205,893	453,094	356,574	385,392	28,818	—	—	141,414
Arms, ammunition, and military stores :—									
Fire-arms (small) and parts of fire-arms.	30,989	108,015	993,820	409,679	18,924	—	390,755	—	12,065
Gunpowder - -	1,636	315	180	226	2,015	1,789	—	379	—
Of all other kinds -	14,209	11,688	7,201	17,422	18,304	882	—	4,095	—
Beer and ale - -	100,375	31,452	31,446	33,053	43,681	10,628	—	—	56,694
Coals and culm - -	192,779	248,020	202,012	170,529	129,623	—	40,906	—	63,156
Cotton, piece goods - -	3,849,915	1,254,345	1,842,338	1,611,764	1,676,780	65,016	—	—	2,173,135
„ thread for sewing -	313,654	140,537	244,161	280,330	214,050	—	66,280	—	99,604
Earthenware and porcelain -	654,283	216,998	320,916	356,329	398,338	42,009	—	—	255,945
Haberdashery and millinery -	1,347,268	628,383	623,576	665,609	761,778	96,169	—	—	585,490
Hardware and cutlery -	1,054,908	651,456	462,100	429,011	468,761	39,750	—	—	586,147
Linen, piece goods - -	1,893,427	642,696	1,694,046	2,076,761	2,483,703	406,942	—	590,276	—
„ thread - -	172,560	85,345	203,152	200,228	186,170	—	14,058	13,610	—
Metals :—									
Copper, sheets, nails, &c.	58,338	14,154	26,634	16,347	16,316	—	31	—	42,022
Iron, pig - -	229,283	88,687	61,819	129,063	215,429	86,366	—	—	13,854
„ Bar, bolt, and rod -	735,121	176,945	392,456	517,697	715,915	198,253	—	—	19,171
„ Railway, of all kinds	916,361	176,897	89,130	419,625	832,342	412,717	—	—	84,019
„ Cast - -	23,431	11,338	11,769	28,911	14,175	—	14,736	—	9,256
„ Hoops, sheets, and boiler plates.	299,443	81,296	159,956	191,283	222,169	30,886	—	—	77,274

Articles.	1860.	1861.	1862.	1863.	1864.	Increase or Decrease in 1864 as compared with 1863.		Increase or Decrease in 1863 as compared with 1860.	
						Increase.	Decrease.	Increase.	Decrease.
Metals—*cont.*	£	£	£	£	£	£	£	£	£
Iron, Wrought, of all kinds	199,448	92,504	132,317	209,978	260,740	50,762	—	61,292	—
,, Steel, unwrought -	653,058	308,300	468,809	531,249	490,994	—	40,255	—	162,064
Lead, pig and lead shot -	88,531	16,156	262,346	51,016	239,434	188,418	—	150,903	—
Tin plates - -	1,018,536	417,360	688,201	746,454	658,218	—	88,236	—	360,318
Oil seed - - -	74,775	1,960	7,885	3,634	47,074	43,440	—	—	27,701
Salt - - - -	119,993	78,766	63,231	26,977	36,623	9,646	—	—	83,370
Silk manufactures :—									
Stuffs, handkerchiefs, and ribbons.	124,206	95,833	110,850	128,543	119,736	—	8,807	—	4,470
Other articles of silk only	114,590	24,470	85,174	87,934	75,831	—	12,103	—	38,759
Mixed with other materials	219,565	64,226	16,169	19,153	39,007	19,854	—	—	180,558
Spirits, British - -	66,322	18,039	33,218	14,713	11,229	—	3,484	—	55,093
Wool, sheep and lambs' -	7,245	71,886	92,536	38,828	37,242	—	1,586	29,997	—
Woollen manufactures :—									
Cloths, coatings, &c. -	629,017	393,423	689,878	670,512	709,766	39,254	—	80,749	—
Worsted stuffs - -	2,424,893	1,038,424	1,141,996	2,003,690	2,057,994	54,304	—	—	366,899
Carpets and druggets -	360,140	126,934	237,204	268,318	280,442	12,124	—	—	79,698
All other articles - -	3,151,960	1,541,763	2,478,250	2,632,952	2,835,850	202,898	—	—	316,110
	21,667,065	9,064,504	14,327,870	15,344,392	16,704,080	2,040,925	681,237	931,301	5,894,286
						681,237			931,301
				Net *increase* in 1864 as compared with 1863		1,359,688		Net *decrease* in 1864 as compared with 1860	4,962,985

Office of the Inspector-General of Imports and Exports,
Custom House, London, 28th March 1865.

JOHN A. MESSENGER.

APPENDIX (O.)—No. 2.

AN ACCOUNT of the Computed Real Value of the Imports into the United Kingdom from the United States, for the Years 1862, 1863, and 1864, respectively.

—	Ports on Atlantic.						Ports on Pacific.			Total from United States.		
	1862.		1863.		1864.							
	Northern States.	Southern States.	Northern States.	Southern States.	Northern States.	Southern States.	1862.	1863.	1864.	1862.	1863.	1864.
	£	£	£	£	£	£	£	£	£	£	£	£
1st Quarter -	5,083,514	155,745	4,080,540	134,256	3,385,130	77,263	80,136	145,434	115,555	5,319,395	4,360,230	3,577,948
2d „ -	5,452,843	214,820	4,859,488	150,407	4,693,211	63,584	234,036	148,601	174,792	5,901,699	5,158,496	4,931,587
3d „ -	6,946,108	307,629	4,819,717	151,247	4,780,905	116,349	26,957	179,063	92,795	7,280,694	5,150,027	4,990,049
4th „ -	8,807,481	391,132	4,768,960	79,532	4,309,427	108,568	14,717	54,765	5,998	9,213,330	4,903,257	4 423,993
Total -	26,289,946	1,069,326	18,528,705	515,442	17,168,673	365,764	355,846	527,863	389,140	27,715,118	19,572,010	17,923,577

Office of the Inspector-General of Imports and Exports,
Custom House, London, 28th March 1865.

JOHN A. MESSENGER.

AN ACCOUNT showing the Quantity of Tea Imported into the United Kingdom in each year from 1848 to 1864 inclusive, specifying the Quantity Imported into London and into Ports other than London, and from the Year 1852 the Quantity imported severally into London, Liverpool, and Ports other than London and Liverpool; also the relative Per-centage of the parts of the whole.

YEARS.	Quantity of Tea Imported into the United Kingdom.	Quantity of Tea Imported into the Port of London.	Quantity of Tea Imported into Ports other than London.		Per-centage of Import taken by London.	Per-centage of Import taken by Ports other than London.	
1848 - -	lbs. 47,774,755	lbs. 33,630,653	lbs. 14,144,702		70.39	29.61	
1849 - -	53,459,469	41,136,442	12,323,027		76.95	23.05	
1850 - -	50,512,384	37,453,222	13,059,162		74.15	25.85	
1851 - -	71,466,421	52,120,377	19,346,044		72.93	27.07	
			Quantity of Tea Imported into Liverpool.	Quantity of Tea Imported into Ports other than London and Liverpool.		Per-centage of Import taken by Liverpool.	Per-centage of Import taken by Ports other than London and Liverpool.
1852 -	66,360,535	51,289,296	lbs. 13,013,343	lbs. 2,057,896	77.29	19.6	3.11
1853 -	70,735,135	52,211,734	16,443,750	2,079,651	73.81	23.25	2.94
1854 -	85,792,032	71,382,603	12,666,526	1,742,903	83.2	14.77	2.03
1855 -	83,259,657	69,686,584	12,025,603	1,547,470	83.7	14.44	1.86
1856 -	86,200,414	71,193,821	12,393,271	2,613,322	82.59	14.38	3.03
1857 -	64,493,989	54,684,501	8,433,828	1,375,660	84.79	13.08	2.13
1858 -	75,432,535	68,098,794	5,329,284	2,004,457	90.28	7.06	2.66
1859 -	75,077,452	68,614,342	5,561,493	901,617	91.39	7.40	1.20
1860 -	88,946,636	84,401,976	4,116,236	428,424	94.89	4.63	.48
1861 -	96,577,183	87,431,870	8,011,140	1,134,173	90.53	8.29	1.18
1862 -	114,787,440	109,750,188	4,018,815	1,018,437	95.61	3.50	.89
1863 -	136,803,218	132,186,194	4,571,759	47,265	96.62	3.34	.04
1864 -	124,359,243	122,335,601	1,975,400	48,242	98.37	1.59	04

APPENDIX (P.)—No. 2.

An Account showing the Quantity of Tea annually entered for Home Consumption in the United Kingdom, with the average rate and aggregate Amount of Duty collected thereon, specifying the Quantity entered in London, the Amount of Duty thereon, the Quantity entered in Ports other than London, and the Amount of Duty thereon, and severally, the relative Per-centage of Import and Per-centage of Duty collected, from the year 1848 to 1864 inclusive.

Years.	Quantity of Tea entered for Home Consumption in the United Kingdom.	Amount of Duty received thereon.	Average rate of Duty per lb. paid on Year's Consumption.	Average price per lb. in Bond.	Quantity of Tea entered for Home Consumption in the Port of London.	Amount of Duty received thereon.	Quantity of Tea entered for Home Consumption in Ports other than London.	Amount of Duty received thereon.	Per-centage of Import Port of London.	Per-centage of Import into Ports other than London.	Per-centage of Duty collected in Port of London.	Per-centage of Duty collected in Ports other than London.
	lbs.	£	s. d.	s. d.	lbs.	£	lbs.	£	lbs.	lbs.	£	£
1848 - -	48,734,780	5,329,992	2 2¼	1 0½	27,241,060	2,979,491	21,493,720	2,350,501	70.39	29.61	55.9	44.1
1849 - -	50,021,576	5,471,422	2 2¼	1 1	27,926,528	3,054,464	22,095,048	2,416,958	76.95	23.05	55.82	44.18
1850 - -	51,172,302	5,596,961	2 2¼	1 3½	28,838,958	3,154,261	22,334,344	2,442,700	74.15	25.85	56.36	43.64
1851 - -	53,949,059	5,900,625	2 2¼	1 2½	30,774,089	3,365,916	23,174,970	2,534,709	72.93	27.07	57.04	42.96
1852 - -	54,713,034	5,984,172	2 2¼	1 0¼	31,240,612	3,416,942	23,472,422	2,567,230	77.29	22.71	57.1	42.9
1853 - -	58,834,087	5,633,791	1 11¼	1 3¼	31,732,305	3,074,067	27,101,782	2,609,724	73.81	26.19	54.08	45.92
1854 - -	61,953,041	4,780,149	1 6½	1 3½	33,235,356	2,561,892	28,717,685	2,218,257	83.2	16.8	53.6	46.4
1855 - -	63,429,286	5,310,275	1 8	1 3	35,193,972	2,932,851	28,235,314	2,377,444	83.7	16.3	55.23	44.77
1856 - -	63,278,212	5,536,626	1 9	1 2¾	35,638,309	3,120,102	27,639,903	2,416,524	82.59	17.41	56.35	43.65
1857 - -	69,150,843	5,060,048	1 5¼	1 5⅘	37,900,773	2,763,598	31,250,070	2,296,450	84.79	15.21	54 62	45.38
1858 - -	73,217,484	5,186,170	1 5	1 4⅝	41,253,009	2,922,110	31,964,475	2,264,060	90.28	9.72	56.34	43.66
1859 - -	76,362,008	5,408,924	1 5	1 6⅛	44,338,075	3,140,538	32,023,933	2,268,386	91.39	8.61	58.06	41.94
1860 - -	76,842,016	5,442,923	1 5	1 6¾	45,961,045	3,255,489	30,880,971	2,187,434	94.89	5.11	59.81	40.19
1861 - -	77,949,464	5,521,320	1 5	1 5	47,617,353	3,330,282	30,932,111	2,191,038	90.53	9.47	60.32	39.68
1862 - -	78,817,060	5,582,793	1 5	1 7⅜	48,447,133	3,431,376	30,369,927	2,151,217	95.61	4.39	61.47	38.53
1863 - -	85,206,779	4,652,822	1 1⅗	1 6⅛	52,782,908	2,884,688	32,423,871	1,768,134	96.62	3.38	62.	38.
1864 - -	88,637,099	4,431,868	1 0	1 6½	56,124,794	2,806,215	32,512,305	1,625,653	98.37	1.63	63.32	36.68

APPENDIX (P.)—No. 3.

AN ACCOUNT showing the business of the Tea Department in the Port of London, from 1853 to 1864 inclusive, as exhibited by the Number of Duty Paid Warrants, and the Quantity of Tea delivered thereby; the Number of Removals, Exports, and Store Bills, and the respective Quantities of Tea delivered thereby; the Number of Letters of Advice containing the particulars as to Import Numbers, and Weights of Packages removed under Bond to other Ports; the Number of Certificates of Arrival received in discharge of such Removals, together with the Rate per cent. Increase in the Quantity of Tea removed, and the Number of Letters of Advice in each succeeding Year over the Year 1853.

YEARS.	No. of Duty Paid Warrants.	Quantity of Tea delivered thereby.	No. of Removals, Exports, and Stores.	Quantity of Tea delivered for removals under Bond.	Quantity of Tea delivered for Ships' Stores.	Quantity of Tea delivered for Exportation.	No. of Letters of Advice to Out-ports.	No. of Certificates of Arrival.	Increase per cent. of each Year over 1853.	
									Quantity of Tea removed.	No. of Letters of Advice.
		lbs.		lbs.	lbs.	lbs.				
1853 - -	258,762	31,732,305	24,647	13,720,965	431,093	3,723,410	8,719	8,719	—	—
1854 - -	251,104	33,235,356	27,827	15,885,541	246,260	6,751,745	10,863	10,863	15·77	24·59
1855 - -	249,843	35,193,972	30,047	19,173,102	283,107	11,026,207	12,961	12,961	39·73	48·65
1856 - -	256,034	35,658,309	31,169	19,692,131	258,307	4,505,192	14,055	14,055	43·52	61·2
1857 - -	292,757	37,900,773	34,704	22,191,770	319,143	6,946,625	17,031	17,031	61·73	95·33
1858 - -	300,907	41,253,009	37,106	22,673,222	484,625	6,161,681	20,235	20,235	65·24	132·08
1859 - -	313,686	44,306,863	40,291	24,524,213	232,593	5,418,416	23,226	23,226	78·73	166·38
1860 - -	336,919	45,961,045	45,161	25,116,505	225,850	7,670,382	25,849	25,849	80·08	196·46
1861 - -	346,960	46,971,549	49,728	27,673,422	215,494	11,367,277	34,524	34,524	101·68	295·96
1862 - -	355,025	48,404,104	53,931	26,087,527	254,834	25,634,849	34,840	34,840	91·77	299·58
1863 - -	392,816	52,733,086	60,886	31,263,805	580,920	25,055,777	41,799	41,799	127·85	379·4
1864 - -	408,467	56,064,752	61,729	31,130,374	576,399	26,619,957	47,564	47,564	126·88	445·52

APPENDIX (Q.)—No. 1.

A STATEMENT showing the Declared Value of British and Irish Produce and Manufacture exported to France in the Years 1860, 1861, 1862, 1863, and 1864, specifying the Principal Articles.

Articles.	1860.	1861.	1862.	1863.	1864.	Increase or Decrease in 1864, as compared with 1863.		Increase or Decrease in 1864, as compared with 1860.	
						Increase.	Decrease.	Increase.	Decrease.
	£	£	£	£	£	£	£	£	£
Alkali, soda	9,432	26,658	39,231	61,300	65,828	4,528	—	56,396	—
Apparel and haberdashery	44,418	118,215	195,514	182,048	125,026	—	57,022	80,608	—
Beer and ale	14,428	16,231	19,427	29,173	26,614	—	2,559	12,186	—
Caoutchouc, manufactures of	18,472	34,775	72,757	91,580	126,116	34,536	—	107,644	—
Cement	32,979	42,701	44,426	54,257	99,319	45,062	—	66,340	—
Coals, cinders, and culm	564,243	617,891	611,942	543,738	622,905	79,167	—	58,662	—
Corn, wheat	5,644	963,707	18,727	78,978	20,370	—	58,608	14,726	—
„ wheatflour	9	78,743	828	2,815	11	—	2,804	2	—
Cotton yarn	50,459	187,228	245,807	178,467	168,150	—	10,317	117,691	—
„ piece goods	206,849	478,327	548,381	452,128	519,932	67,804	—	313,083	—
„ hosiery small wares	41,412	83,554	190,256	103,991	118,142	14,151	—	76,730	—
Drugs and chemical products	16,263	36,069	80,079	101,221	100,156	—	1,065	83,893	—
Earthenware and porcelain	7,377	21,518	54,359	51,701	53,982	2,281	—	46,605	—
Hardwares and cutlery	118,265	201,410	250,027	200,240	223,153	22,913	—	104,888	—
Horses	94,740	50,135	79,676	77,197	55,543	—	21,654	—	39,197
Linen yarn	70,620	104,469	99,244	175,052	129,273	—	45,779	58,653	—
„ piece goods	61,097	181,066	189,015	180,982	206,075	25,093	—	144,978	—
Machinery, steam engines	13,002	12,867	13,474	17,966	7,930	—	10,036	—	5,072
„ other sorts	158,018	349,115	339,268	345,866	365,476	19,610	—	207,458	—
Metals, copper, wrought and unwrought	548,072	316,199	388,549	856,388	341,753	—	514,635	—	206,319
„ iron, wrought and unwrought	370,381	794,699	1,178,485	835,643	603,425	—	232,218	233,044	—
„ lead and shot	24,197	13,889	10,261	16,686	65,424	48,738	—	41,227	—
„ tin, unwrought	115,123	98,777	107,572	147,759	145,410	—	2,349	30,287	—
„ „ plates	36,076	38,563	55,192	59,326	60,089	763	—	24,013	—
„ zinc, wrought and unwrought	31,270	7,238	20,211	934	7,514	6,580	—	—	23,756

APPENDIX (Q.)—No. 1—*continued.*

Articles.	1860.	1861.	1862.	1863.	1864.	Increase or Decrease in 1864, as compared with 1863.		Increase or Decrease in 1864, as compared with 1860.	
						Increase.	Decrease.	Increase.	Decrease.
	£	£	£	£	£	£	£	£	£
Naphtha, Paraffine Oil, &c. - -	19,149	46,428	61,143	109,831	80,032	—	29,799	60,883	—
Oil, seed - - - -	342,021	317,879	262,614	162,342	251,766	89,424	—	—	90,255
Painters' colours - - -	34,082	55,270	41,145	30,099	38,602	8,503	—	4,520	—
Silk, yarn - - - -	131,970	133,497	170,240	139,506	152,560	13,054	—	20,590	—
„ thrown - - - -	221,608	186,609	233,768	183,300	153,470	—	29,830	—	68,138
„ Manufactures - - -	60,124	117,707	75,640	121,664	190,191	68,527	—	130,067	—
Spirits, British - - -	49,610	216,232	43,598	37,802	80,093	42,291	—	30,483	—
Telegraphic wire and apparatus -	75,461	15,366	4,460	1,604	13,809	12,205	—	—	61,652
Wool, sheep, and lambs' - -	573,091	782,698	385,073	348,773	317,992	—	30,781	—	255,099
Woollen yarn - - - -	233,828	235,782	372,324	369,129	340,641	—	28,488	106,813	—
Woollen manufactures, cloths, coatings, &c. -	36,536	147,581	726,415	193,442	187,963	—	5,479	151,427	—
„ „ worsted stuffs -	234,161	773,385	927,644	1,094,940	1,020,613	—	74,327	786,452	—
„ „ flannels and carpets	9,328	71,358	128,826	102.257	80,717	—	21,540	71,389	—
„ „ of other sorts -	13,614	44,076	36,028	28,346	29,869	1,523	—	16,255	—
All other articles - - -	562,551	877,676	887,741	904,838	1,004,826	99,988	—	442,275	—
	5,249,980	8,895,588	9,209,367	8,673,309	8,200,760	706,741	1,179,290	3,700,268	749,488
							706,741	749,488	
Net decrease in 1864, as compared with 1863 - - -							472,549	2,950,780	Net increase in 1864, as compared with 1860.

Office of the Inspector-General of Imports and Exports,
Custom House, London, 28th March 1865.

JOHN A. MESSENGER.

APPENDIX (Q.)—No. 2.

An Account of the Computed Real Value of the Imports into the United Kingdom from France, in the Years 1861, 1862, 1863, and 1864 respectively, distinguishing the principal Articles, exclusive of Corn, Meal, and Flour.

Articles.	Years.			
	1861.	1862.	1863.	1864.
	£	£	£	£
Brass and bronze manufactures	96,192	140,829	132,853	99,564
Butter	703,467	566,512	611,246	858,793
China and porcelain ware	77,763	77,169	105,343	98,559
Clocks and watches; viz.—				
Clocks	161,456	146,958	188,909	184,521
Watches	321,400	258,409	250,423	228,217
Cotton, raw	38,840	327,323	160,108	628,339
Cotton manufactures	399,210	450,397	553,602	411,205
Eggs	438,275	454,864	563,354	713,570
Flax, undressed	68,570	230,325	182,397	119,668
Flowers, artificial	275,092	346,100	302,156	302,464
Fruit, raw	192,402	122,826	182,807	171,788
Garancine	78,155	148,239	140,161	172,382
Glass, plate	16,174	45,716	63,641	95,024
Hides, tanned	89,439	142,208	177,660	184,321
Leather manufactures; viz.—				
Gloves	646,216	728,876	849,224	1,047,738
Boots and shoes	86,195	72,740	92,985	37,461
Boot fronts	52,702	78,687	58,195	17,326
Madder and madder root	111,466	107,471	164,062	158,048
Oil, rape	41,890	76,121	159,939	109,678
Oil-seed cakes	271,266	244,827	149,948	153,335
Oil or spirit of turpentine	53,187	205,691	320,177	330,524
Plaiting of straw, chip, or other materials	90,178	85,943	113,118	68,881
Potatoes	77,744	207,101	176,970	94,137
Resin	58,361	263,223	496,477	533,309
Seeds, clover	112,031	139,751	98,752	220,156
Silk, raw	470,101	692,253	1,788,053	1,157,619
,, waste, knubs and husks	230,214	249,972	216,631	184,473
,, thrown	152,133	68,677	79,157	106,939
Silk manufactures of Europe	4,902,272	5,312,357	5,213,852	5,979,611
Spirits, viz. brandy	898,889	1,001,980	1,095,885	1,490,531
Sugar, refined and unrefined	95,320	530,048	375,330	702,160
Wine	952,797	717,356	697,742	792,859
Wool, sheep and lambs	101,845	569,105	251,477	399,425
Woollen Manufactures	1,057,837	1,247,021	1,357,909	1,210,305
All other articles except corn	3,239,505	3,867,661	4,539,731	4,700,001
Total (exclusive of corn, meal, and flour)	16,658,584	19,924,786	21,910,274	23,763,021

Office of the Inspector-General of Imports and Exports,
Custom House, London, 27th March 1865.

JOHN A. MESSENGER.

APPENDIX (R.)—No. 1.

A STATEMENT showing the computed Real Value of Foreign and Colonial Merchandise exported from the United Kingdom to the United States of America in the Years 1861, 1862, 1863, and 1864, distinguishing the principal Articles.

Articles.	Computed real Value.			
	1861.	1862.	1863.	1864.
	£	£	£	£
Arms and ammunition	21,051	81,997	—	1,240
Caoutchouc	5,872	57,072	35,275	34,137
Cotton, raw :				
Produce of United States	183,876*	1,365,127†	855,887†	603,951§
„ Brazil	-	-	16,195‡	22,828§
„ Egypt	-	6,692†	25,442	25,997§
„ British India	37,565*	344,754†	407,000‡	326,398§
„ other countries	-	9,341†	87,225‡	191,874§
Gum, Arabic	19,361	40,370	16,457	14,295
„ unenumerated	2,251	7,130	41,520	34,740
Hemp, dressed and undressed	3,236	68,340	76,176	30,310
Hides, undressed	1,674	41,811	26,106	8,232
Indigo	513,277	540,431	184,618	202,341
Iron in bars	12,447	29,860	66,266	59,092
Linen sails and manufactures	2,380	40,029	13,514	4,558
Liquorice juice and paste	4,200	28,981	22,147	30,377
Oil turpentine	17,646	38,930	32,810	29,023
Opium	108,704	70,204	37,085	40,478
Pepper	8	35,711	458	41,796
Quicksilver	90	5,321	26,220	20,131
Rags for making paper	943	49,548	26,509	4,933
Rice	42,997	132,055	101,894	218,859
Saltpetre and nitre, cubic	1,760	96,220	22,538	35,735
Seeds, flax, and linseed	-	57,557	53,451	38,784
Silk, knubs or husks	-	86,614	1,266	450
„ raw	28,993	96,072	152,593	147,216
Skins, goat, raw and tanned	11,331	35,860	10,510	16,366
Tea	51,592	201,044	416,245	399,076
Wool, sheep and lambs	601,638	742,156	1,049,919	285,381
Other articles (collectively)	293,287	586,230	567,067	429,900
Total	1,961,179	4,846,037	4,352,393	3,298,398

* Total value of cotton wool, 221,441*l.*
† Total value of cotton wool, 1,725,914*l.*
‡ Total value of cotton wool, 1,391,749*l.*
§ Total value of cotton wool, 1,171,048*l.*

NOTE.—With some few exceptions, altogether inconsiderable in their aggregate amount, the exports exhibited in this statement were addressed exclusively to the *Northern Atlantic Ports* of the United States.

Office of the Inspector-General of Imports and Exports,
Custom House, London, 15th April 1865.

J. A. MESSENGER.

APPENDIX (R.)—No. 2.

A STATEMENT showing the computed Real Value of Foreign and Colonial Merchandise exported from the United Kingdom to France in the Years 1861, 1862, 1863, and 1864, distinguishing the principal Articles.

Articles.	Computed Real Value.			
	1861.	1862.	1863.	1864.
	£	£	£	£
Bacon and Hams	1,281	59,456	99,081	35,665
Bark, Peruvian	43,760	28,394	18,833	20,178
Caoutchouc	56,908	57,899	63,346	62,373
Cochineal	21,004	21,199	41,828	26,566
Cocoa	34,826	4,991	10,357	8,969
Coffee	124,033	405,013	482,467	322,669
Copper, unwrought and part wrought	145,890	361,125	271,748	461,692
Corn, wheat	579,836	20,317	23,983	1,901
„ wheat flour	204,545	89	5,540	1,128
Cotton, raw :				
Produce of United States	216,503*	703,577†	329,259‡	445,836§
„ Brazil	2,951*	87,085†	50,820‡	68,082§
„ Egypt	16,590*	118,381†	149,426‡	433,938§
„ British India	135,882*	2,810,636†	4,582,548‡	3,463,216§
„ Other countries	—	17,687†	205,490‡	829,349§
Flax, dressed and undressed	42,429	8,867	26,994	33,535
Guano	43,571	7,563	11,637	6,289
Gum, lac, viz., shell-lac	21,356	37,893	33,411	33,691
Hair manufactures	177,656	231,404	92,793	49,299
Hemp, and other like substances (except jute)	33,508	19,722	27,730	35,034
„ jute	54,353	82,160	183,266	257,034
Hides, untanned	38,594	32,873	86,428	101,051
Indigo	171,224	116,803	75,033	158,245
Oil, coco-nut	42,540	29,976	26,595	33,934
„ palm	4,700	3,322	33,812	23,609
Quicksilver	19,739	26,214	37,439	34,963
Rice	165,694	60,766	201,571	182,379
Seeds, flax, linseed, and rapeseed	205,973	73,091	180,154	196,747
„ for expressing oil therefrom	20,104	51,527	58,429	123,614
Silk, raw	3,191,838	4,404,410	3,285,348	3,545,919
„ thrown	100,059	198,010	310,805	511,336
Skins, goat, raw and tanned	23,068	44,879	63,724	43,878
Sugar unrefined	3,449	308	174,471	53,020
Tallow	189,792	147,702	5,947	699
Teeth, elephants'	61,708	61,811	64,752	81,874
Tin, unwrought	34,034	68,145	84,588	96,848
Wine	64,623	50,256	53,284	51,655
Wool, sheep and lambs'	1,502,436	1,350,735	2,190,434	3,053,177
Other articles (collectively)	735,226	752,016	977,886	1,067,300
Total	8,531,683	12,556,302	14,621,257	15,956,692

* Total value of cotton wool, 371,926*l.*
† Total value of cotton wool, 3,737,366*l.*
‡ Total value of cotton wool, 5,317,543*l.*
§ Total value of cotton wool, 5,240,421*l.*

Office of the Inspector-General of Imports and Exports,
Custom House, London, 15th April 1865.

J. A. MESSENGER.

APPENDIX (S.)

A RETURN of the Ports at which Cattle, &c. have been imported in the Year 1864, stating the Number imported at each Port.

Ports at which Imported.	Live Stock imported into the United Kingdom in the Year 1864.					
	Oxen and Bulls.	Cows.	Calves.	Sheep.	Lambs.	Swine and Hogs.
	Number.	Number.	Number.	Number.	Number.	Number.
London	115,219	1,789	29,961	322,409	17,102	50,716
Liverpool	3,446	120	—	64	—	7
Southampton	2,509	75	97	64	—	246
Newcastle	940	1,596	78	7,200	—	1,686
Hull	6,603	15,364	8,227	37,582	299	7,415
Arundel	4	183	12	—	—	327
Bristol	—	2	—	—	—	—
Dover	—	—	33	1	81	4,572
Falmouth	1,955	500	3	12	—	89
Folkestone	—	—	—	—	—	2
Fowey	—	—	4	—	—	5
Goole	—	4,063	1,366	284	31	384
Grimsby	248	1	—	31,558	—	837
Hartlepool	910	830	1,360	24,052	118	4,971
Harwich	11,712	3,153	10,853	37,082	223	13,782
Lowestoft	66	—	—	12	—	—
Lynn	—	—	—	—	—	4
Newhaven	—	115	6	4	—	229
Penzance	58	1	1	—	—	—
Plymouth	2,719	5	128	—	—	44
Poole	—	1	—	—	—	—
Portsmouth	—	—	—	—	—	7
Rye	—	38	1	—	—	—
Swansea	—	1	—	—	—	—
Dundee	151	—	—	—	—	—
Glasgow	192	—	—	—	—	—
Leith	3,075	1,069	71	18,023	42	31
Dublin	794	—	25	—	—	8
Total	150,601	28,906	52,226	478,347	17,896	85,362

Office of the Inspector-General of Imports and Exports, Custom House, London, 18th May 1865.

JOHN A. MESSENGER.

APPENDIX (T.)

A STATEMENT for the Year to the 31st December 1864, of the total estimated Amount of Duties of Customs repealed or reduced, and imposed or augmented.

	Net Revenue.
	£
Duties repealed: *Nil.*	
Duties reduced, viz.:	
Sugar and Molasses - - - -	1,741,272
Succades, Confectionery, and other Articles preserved in Sugar - - -	3,112
Total estimated loss by the reduction of duties - - -	1,744,384
Duties imposed or augmented: *Nil.*	

Office of the Inspector-General of Imports and Exports, Custom House, London, 4th April 1865.

JOHN A. MESSENGER.

APPENDIX (U.)

A RETURN showing the quantity in cwts. of Raw Sugar entered for Home Consumption in each Month, from January 1863 to March 1865.

	January.				February.			
	1863.	1864.	Increase.	Decrease.	1863.	1864.	Increase.	Decrease.
1st Quality -	4,205	2,012	- -	2,193	2,453	1,814	- -	639
2nd „ -	301,196	160,291	- -	140,905	301,483	194,873	- -	106,610
3rd „ -	452,299	390,842	- -	61,457	468,182	464,816	- -	3,366
Total -	757,700	553,145	- -	204,555	772,118	661,503	- -	110,615

	March.				April.			
	1863.	1864.	Increase.	Decrease.	1863.	1864.	Increase.	Decrease.
1st Quality -	1,161	1,642	481	—	2,914	3,416	502	—
2nd „ -	295,536	178,651	- -	116,885	292,623	287,550	- -	5,073
3rd „ -	439,355	453,491	14,136	—	451,315	394,113	- -	57,202
Total -	736,052	633,784	14,617	116,885	746,852	685,079	502	62,275

APPENDIX (U.)—*continued.*

	May.				June.			
	1863.	1864.	Increase.	Decrease.	1863.	1864.	Increase.	Decrease.
1st Quality -	2,156	6,677	4,521	—	1,878	10,489	8,611	—
2nd „ -	320,973	328,987	8,014	—	363,574	391,782	28,208	—
3rd & 4th „ -	546,812	568,193	21,381	—	574,167	573,898	- -	269
Total -	869,941	903,857	33,916	—	939,619	976,169	36,819	269

	July.				August.			
	1863.	1864.	Increase.	Decrease.	1863.	1864.	Increase.	Decrease.
1st Quality -	2,001	14,715	12,714	—	706	22,937	22,231	—
2nd „ -	364,650	361,001	- -	3,649	368,885	391,342	22,457	—
3rd & 4th „ -	519,775	474,553	- -	45,222	515,053	450,619	- -	64,434
Total -	886,426	850,269	12,714	48,871	884,644	864,898	44,688	64,434

	September.				October.			
	1863.	1864.	Increase.	Decrease.	1863.	1864.	Increase.	Decrease.
1st Quality -	764	10,755	9,991	—	862	11,214	10,352	—
2nd „ -	328,248	294,063	- -	34,185	307,044	386,695	79,651	—
3rd & 4th „ -	547,838	334,239	- -	213,599	563,726	429,395	- -	134,331
Total -	876,850	639,057	9,991	247,784	871,632	827,304	90,003	134,331

	November.				December.			
	1863.	1864.	Increase.	Decrease.	1863.	1864.	Increase.	Decrease.
1st Quality -	3,382	8,654	5,272	—	660	5,783	5,123	—
2nd „ -	270,536	352,488	81,952	—	146,285	253,240	106,955	—
3rd & 4th „ -	535,550	501,367	- -	34,183	351,849	473,012	121,163	—
Total -	809,468	862,950	87,224	34,183	498,794	732,035	233,241	—

	January.				February.			
	1864.	1865.	Increase.	Decrease.	1864.	1865.	Increase.	Decrease.
1st Quality -	2,012	9,881	7,869	—	1,814	6,530	4,716	—
2nd „ -	160,291	322,458	162,167	—	194,873	359,094	164,221	—
3rd & 4th -	390,842	424,685	33,843	—	464,816	416,492	- -	48,324
Total -	553,145	757,024	203,879	—	661,503	782,116	168,937	48,324

	March.			
	1864.	1865.	Increase.	Decrease.
1st Quality -	1,642	5,694	4,052	—
2nd „ -	178,651	370,735	192,084	—
3rd & 4th „ -	453,491	551,607	98,116	—
Total -	633,784	928,036	294,252	—

Total quantities in cwts. of Sugar entered for Home Consumption in the Financial Years ending 31st March 1864 and 1865 respectively.

	Year ended 31st March 1864.	Year ended 31st March 1865.	Increase.	Decrease.
1st Quality -	20,791	116,745	95,954	—
2nd „ -	3,296,633	4,099,435	802,802	—
3rd & 4th „ -	5,915,234	5,592,173	—	323,061
Total -	9,232,658	9,808,353	898,756	323,061

Net Increase - - 575,695

APPENDIX (V.)

AN ACCOUNT of the Quantities of Unmanufactured Tobacco imported into the United Kingdom in each Year from 1860 to 1864 inclusive, distinguishing the principal Countries from which imported.

Countries from which Imported.	Quantities of Unmanufactured Tobacco imported into the United Kingdom.				
	1860.	1861.	1862.	1863.	1864.
	lbs.	lbs.	lbs.	lbs.	lbs.
Hanse Towns -	531,742	951,758	1,317,232	1,354,193	1,229,946
Holland -	3,236,824	7,899,288	8,651,421	7,783,921	6,050,409
Turkey Proper -	1,197,834	1,956,596	936,963	1,229,710	1,435,748
Philippine Islands	—	61	—	—	992,273
Japan - -	45,386	125	375,829	803,518	1,596,968
Cuba - -	615,172	619,419	557,893	847,739	819,388
New Granada -	479,838	302,115	1,288,937	848,926	4,452,578
Uruguay -	10,948	—	82	201,426	273,383
Argentine Confederation -	793,695	1,866,334	2,150,896	2,859,714	1,515,780
Other Countries except United States -	1,540,627	3,451,564	3,511,526	3,382,830	2,934,360
Total, exclusive of the United States -	8,452,066	17,047,260	18,790,780	19,311,977	21,300,833
United States -	40,484,405	33,713,856	21,191,343	32,006,307	39,741,834
All Parts -	48,936,471	50,761,116	39,982,123	51,318,284	61,042,667

Office of the Inspector-General of Imports and Exports, Custom House, London, 12th June 1865.

JOHN A. MESSENGER.

Report on the Health of the Out-door Officers, Watermen, and other inferior Officers of Her Majesty's Customs during 1864, by Walter Dickson, M.D., R.N., Medical Inspector, Her Majesty's Customs.

No change has taken place in the strength of the force either in London or at Gravesend since last report. The numbers therefore are the same as in last year.

	Stationed in London.	Stationed at Gravesend.	Total.
Out-door officers	611	240	851
Watermen	168	32	200
Messengers	50	—	50
Watchmen	18	2	20
Constables	4	—	4
Doorkeepers	2	—	2
Crew of the "Vigilant"	—	22	22
	853	296	1,149

For statistical purposes they are arranged in three classes, corresponding as near as is practicable with their respective duties; viz., out-door officers, watermen, and messengers, &c. The same classification of the leading forms of disease, which has been in use for the last two years, will be adhered to in the present instance. Such a system affords clearer numerical results in regard both to the number and importance of the cases of sickness. These can be more readily compared, and light may occasionally be thrown on the causation and prevention of disease. The health statistics of this branch of the civil service are thereby assimilated to those of the army and navy, and may one day yield certain data of comparison. It could only, of course, be with soldiers and sailors employed on the home station that such comparison could be made. Important elements of difference exist and must be taken into account. The much greater range of age, and, as a rule, a larger amount of exposure to the weather and a longer proportion of time on duty would tell to the disadvantage of this service. One half of the

customs' officers are upwards of 35, and the nature of the service is probably more continuous and laborious than falls to the lot of military or naval men. But these drawbacks are more than counterbalanced by the better social condition, the domestic comfort, and the much greater chances of promotion which are enjoyed by the inferior officers of this department. The standard of health among the really efficient members of the force is therefore relatively high. Yet the apparent proportion of sickness is considerable, owing chiefly to the circumstance that there is always a number of persons afflicted with chronic maladies, and more particularly consumption and rheumatism, who are thereby incapacitated for duty during a considerable portion of the year. If, as in some instances, a light kind of duty can be allotted to them, it may happen that such cases swell the sick list for some months, not only once but in several successive years. The aggregate of time lost by sickness is necessarily much increased from this cause, as a glance at the column headed "Number of Days' Sickness" will show.

But although from various causes there has been a larger proportion of sickness in this than in the previous year, the amount of mortality has been unprecedentedly small. With one exception—a case of typhus fever—the deaths have been the result of long existing and wasting disease. The cases of superannuation were of similar character, and in point of number were far below the average of preceding years.

Table I.

First Quarter (London).

From 1st of January to 31st of March 1864.

	Diseases.	Remained from last Year.	Admissions to Sick List.				Number of Days' Sickness.
			Out-door Officers.	Watermen.	Messengers, &c.	Total.	
1	Intermittent Fever	–	2	–	–	2	42
	Typhoid Fever	–	–	1	–	1	4
	Febricula	–	4	1	–	5	26
2	Catarrh	1	20	6	1	27	211
	Cynanche	–	8	–	1	9	53
	Bronchitis	–	4	2	3	9	195
	Pneumonia	1	–	–	1	1	90
	Pleurisy	–	1	–	–	1	31
	Phthisis	4	1	–	–	1	302
	Asthma	–	–	2	1	3	58

TABLE I.—*cont.*

	Diseases.	Remained from last Year.	Admissions to Sick List. Out-door Officers.	Watermen.	Messengers, &c.	Total.	Number of Days' Sickness.
3	Dyspepsia	–	3	–	–	3	16
	Diarrhœa	–	4	1	–	5	46
	Dysentery	–	1	–	–	1	13
	Hepatitis	–	3	–	–	3	45
4	Rheumatism	5	8	5	1	14	533
	Gout	–	1	–	–	1	19
	Pleurodynia	–	1	–	1	2	56
5	Phlegmon	–	7	1	–	8	88
	Abscess	1	–	–	–	–	15
	Fistula	–	–	1	–	1	12
	Ulcer	1	–	–	1	1	27
	Erysipelas	–	1	–	–	1	28
	Scabies	–	1	–	–	1	6
	Herpes Zoster	–	1	–	–	1	11
6	Contusion	2	6	1	–	7	118
	Sprain	–	1	3	–	4	71
	Scald	–	2	–	–	2	17
	Spinal Concussion	–	–	1	–	1	44
7	Cephalalgia	–	1	1	–	2	10
	Neuralgia	1	1	–	–	1	18
	Vertigo	–	1	–	–	1	21
	Tremor (Afc.)	–	1	–	–	1	9
	Ophthalmia	1	1	–	–	1	13
	Cataract	–	1	–	–	1	8
	Syphilis	–	1	–	–	1	22
	Orchitis	–	1	–	1	2	11
	Hydrocele	–	1	–	–	1	4
	Urinary Calculus	1	–	–	–	–	91
	Cancer	1	–	–	–	–	6
	Diseased knee-joint	1	–	–	–	–	89
		20	89	26	11	126	2,479

Meteorology of first quarter.

The season was remarkable for the unusual and repeated alternations of frost and thaw. Short periods of sharp cold were followed by warm, damp, foggy weather, and that again by snow and sleet. The extremes of temperature observed were 58° and 14°. The mean temperature of the quarter was as low as 37°·9, being nearly 2° under the winter average of the last quarter of a century, and 5° below that of the preceding year. January showed a mean of 36°·5, February of 36°, and March of 41°. The mean temperature of the dew point was 5° below that of the air. The temperature of the river Thames ranged between the narrow limits of 40° and 43°.

The atmospheric pressure was slightly in excess in January, deficient in February and March. The rain-fall

Its influence on the public health,

amounted to 4½ inches, more than half of which occurred in March. The changes of wind were great and coincident with the singular vicissitudes of temperature. Coming immediately after an extremely mild December and in contrast with the two previous winters which were noted for their warmth, the unwonted rigour of the season was severely felt. The mortality of London was greatly in excess of the average, the rate being no less than 30 in 1,000 instead of 25. Only in two winters, 1848 and 1855, has so high a death rate been recorded as in this quarter.

The influence of an inclement and unhealthy winter could not fail to be felt by the officers of Customs. Although the number of cases admitted did not exceed that of the like period of 1863, the daily sick list was heavier, averaging 27 non-effectives throughout the quarter, and giving, as the mean duration of each case, 19 days.

and on the health of the officers of Customs.

The watermen and messengers yielded a larger porportion of sick than the out-door officers. Many of the cases were of unusually prolonged character, no fewer than nine extending over the whole quarter. Most of these had been handed down from the previous year. Pulmonary and rheumatic affections formed more than one half of the total sickness of the period; the former class exhibiting the high ratio of 40 per cent. Phthisis and bronchitis were, as might be expected from the severity of the weather, the chief burden on the list. Of other serious cases may be noted inflammation of the liver, dysentery, typhoid fever, and erysipelas.

Deaths and superannuations.

Two out-door officers died in the quarter, one of consumption, the other from internal cancer. They had been incapacitated for duty for many months. A waterman was superannuated on account of chronic rheumatism and senile debility.

TABLE II.

SECOND QUARTER (London).

From 1st of April to 30th of June 1864.

	Diseases.	Remained from last Return.	Admissions to Sick List.				Number of Days' Sickness.
			Out-door Officers.	Watermen.	Messengers, &c.	Total.	
1	Intermittent Fever	–	1	2	–	3	24
	Remittent Fever	–	–	–	1	1	31
	Typhus Fever	–	1	–	–	1	48
	Typhoid Fever	1	–	–	–	–	38
	Febricula	–	2	–	–	2	7
	Varicella	–	1	–	–	1	12
2	Catarrh	2	7	5	1	13	84
	Cynanche	–	5	3	1	9	63
	Bronchitis	2	2	1	–	3	51
	Pneumonia	–	1	–	–	1	13
	Pleurisy	1	–	1	–	1	57
	Phthisis	2	2	–	1	3	320
	Asthma	1	1	–	–	1	57
3	Dyspepsia	1	3	–	–	3	23
	Diarrhœa	1	7	1	–	8	34
	Dysentery	2	–	–	–	–	23
	Colic	–	2	–	–	2	29
	Hæmorrhoids	–	2	–	–	2	10
	Hepatitis	–	1	–	–	1	23
4	Rheumatism	3	6	3	2	11	278
	Gout	–	2	–	1	3	15
	Pleurodynia	–	2	1	–	3	13
5	Phlegmon	–	1	–	–	1	6
	Abscess	–	2	1	–	3	67
	Ulcer	–	1	1	–	2	13
	Bubo	–	–	1	–	1	45
	Erysipelas	–	1	1	–	2	16
	Urticaria	–	1	–	–	1	2
	Scabies	–	1	–	–	1	11
	Herpes Zoster	–	1	–	–	1	12
6	Contusion	–	4	1	–	5	56
	Sprain	–	–	–	1	1	7
	Wound	–	4	2	–	6	42
	Injuries of Eye	–	1	–	–	1	6
	Spinal Concussion	1	–	–	–	–	17
7	Cephalalgia	–	1	–	–	1	7
	Tremor	–	1	1	–	2	9
	Ophthalmia	–	3	–	–	3	18
	Cataract	1	–	–	–	–	28
	Angina	–	1	–	–	1	19
	Orchitis	–	1	–	–	1	13
	Varicocele	–	1	–	–	1	3
	Albuminuria	–	1	–	–	1	51
	Urinary Calculus	1	–	–	–	–	91
		19	74	25	8	107	1,792

Meteorology of second quarter.

The beginning of April was cold and changeable. This was succeeded by six weeks of warm weather, and again by a like period of comparative cold. In the earlier time the temperature was $3\frac{1}{2}^{\circ}$ above the average; in the latter

2½° below it. But although thus variable, the weather was uniformly dry. The extremes of temperature recorded in the quarter were 81° and 33°. The mean of April was 48°; of May, 54°; of June, 57°. That of the whole period was 53°, being 1° above the average. For, although June was cold, the extra warmth of the other months compensated for it. The pressure of the atmosphere was slightly in excess, the mean reading of the quarter being 28·84. The rain-fall amounted to 3·5 inches, and of this the greater part fell in May. April and June were unusually dry, the dew point being 8° and 10° below the temperature of the air. N. and E. winds prevailed in May, S. and W. in June. The temperature of the Thames ranged from 50° to 61°. The mortality of London in this quarter does not seem to have greatly exceeded the average, and was considerably less than in the corresponding period of 1863. It is stated to have been at the rate of 23½ per 1,000.

Remarks on sickness in second quarter.

In this force the spring quarter is invariably the healthiest in the year. It is comparatively free alike from the chest affections which occur in severity and frequency in the earlier months, and from the disorders of the intestines which characterise the summer quarter. Slighter complaints from exposure to cold are also, as a rule, fewer at this period. This year, however, notwithstanding the remarkably dry and fine weather that prevailed, the admissions to the list in the quarter were more numerous by 20 to 30 per cent. than formerly. This increase was chiefly from slight cases of cold, sore throat, and rheumatism, and occurred in June, partly by reason of the backward character of that month, partly from other causes which will be adverted to hereafter. The mean daily number on the list was 19, being one more than last year; the average duration of each case was 16 days, which is somewhat less than in last year. Graver and protracted maladies were therefore exceptionally few, while the more trivial cases were unwontedly numerous. Besides phthisis and a few cases of pulmonary inflammation, a severe example of typhus fever, which is a rare disease in the service, one of dropsy connected with disease of the kidney, and a few serious accidents, may be mentioned as occurring in the period. Infantile epidemics, particularly measles, were very prevalent and fatal in London at this time. The families of many of the officers suffered severely, but except in one case of chicken-pox, none of themselves were affected.

One death occurred, that of an out-door officer advanced in life, who had been for a long while labouring under phthisis, and in this weak condition had been attacked by acute inflammation of the lung which degenerated into gangrene. Another out-door officer of long service was superannuated for chronic rheumatism. Death and superannuation.

TABLE III.

THIRD QUARTER (London).

From 1st of July to 30th September 1864.

	Diseases.	Remained from last Return.	Admissions to Sick List.				Number of Days' Sickness.
			Out-door Officers.	Watermen.	Messengers, &c.	Total.	
1	Intermittent Fever	–	1	1	–	2	97
	Remittent Fever	1	–	–	–	–	10
	Typhus Fever	–	–	1	–	1	28
	Typhoid Fever	–	1	–	1	2	55
	Febricula	–	1	1	1	3	35
	Measles	–	–	–	1	1	3
2	Catarrh	2	20	1	1	22	211
	Cynanche	–	4	2	1	7	54
	Bronchitis	1	1	1	–	2	145
	Pneumonia	1	2	1	–	3	84
	Pleurisy	1	–	–	–	–	10
	Phthisis	4	–	–	–	–	327
	Hæmoptysis	–	2	–	–	2	15
3	Dyspepsia	–	6	–	1	7	28
	Diarrhœa	1	17	9	1	27	178
	Colic	–	3	1	–	4	25
	Hæmatemesis	–	2	–	–	2	11
	Jaundice	–	–	1	–	1	14
4	Rheumatism	1	10	6	1	17	255
	Gout	1	2	–	1	3	30
5	Phlegmon	–	8	2	–	10	92
	Ulcer	–	3	1	–	4	71
	Abscess	1	2	–	–	2	100
	Fistula	–	1	–	–	1	13
	Bubo	1	–	–	–	–	92
	Epulis	–	1	–	–	1	2
	Erysipelas	1	–	–	–	–	10
6	Contusion	1	2	1	1	4	49
	Sprain	–	1	–	–	1	5
	Wound	1	1	2	–	3	108
7	Cephalalgia	–	1	1	–	2	18
	Neuralgia	–	2	–	–	2	14
	Tremor	–	1	–	–	1	15
	Epilepsy	–	1	–	–	1	7
	Ophthalmia	–	1	–	–	1	3
	Disease of Heart	–	–	1	–	1	18
	Angina Pectoris	–	1	–	–	1	18
	Albuminuria	1	–	–	–	–	17
	Hydrocele	–	1	–	–	1	13
	Dysuria	–	1	–	–	1	7
	Urinary Calculus	1	–	–	–	–	92
	Debility	–	2	–	–	2	14
		20	102	33	10	145	2,393

Meteorology of third quarter.

The cold weather of June continued to the middle of July. Then came 25 days of unusually hot weather, and this period was succeeded in the end of August by one remarkable for the warmth of the days and the excessive cold of the nights. The thermometric range amounted to 50° in that month, and the air was free from moisture to a degree altogether unprecedented. September was an average month, both as to temperature and humidity.

The extremes recorded as occurring in the quarter, are 89° and 38°. The mean temperature of July was 62°, of August 60°, of September 57°. The average of the whole quarter was 59°·4, which is almost the exact mean of 93 years. The atmospheric pressure gave a mean of 29·85, a slight excess. The mean temperature of the dew point was 49°·7, being 3° below the average; in August this fall exceeded 6°. The amount of rain was only 4·5 inches, being 3 inches less than the mean; the great deficiency occurring in July and August. The temperature of the Thames ranged from 60° to 64°. In consequence of the absence of rain the river was charged during the summer and autumn with a large proportion of solid matter, partly of sewage, but chiefly of sea-salts, which the tidal influx, relatively much stronger than usual, brought up in increased quantity. From this admixture of saline matter, as well as from the low temperature of the water, it followed that the river was less offensive than might have been expected.* "This "year," writes Mr. Glaisher, "is remarkable for its great "dryness, particularly in the month of August; for "the great ranges of temperature in that month amount-

* "As early as the end of May the Thames water contained as much as 124 grains "of solid matter per gallon, the average proportion in a normal state of the river "being but 24 grains, and by the end of August the quantity of impurity had risen "to 386 grains per gallon. Nearly the whole of that was saline matter from the "ocean, the flow of the stream having been upwards instead of downwards; but "with that saline matter there was also brought up a large proportion of sewage, the "quantity of organic matter, chiefly of sewage, being 43 grains per gallon. It was "fortunate that the weather was unusually cold during the whole of that time, and "therefore the river did not become offensive from putrefactive decomposition; but if "the temperature had risen to 68° or 69°, as it did in the summers of 1858, 1859, the "effects of it would no doubt have been seriously unpleasant. That which kept "down the offensiveness of the river during the summer time was either a low tem-"perature or a copious rain-fall; and it was manifest from the experience that had "been gained from the regular examination of the water of the river during the last "six years, that there were periods of many months duration in every year when "from the evaporation of the water and the small supply from above, the flow of "the stream was not downwards but upwards, and that at such times the sewage "discharged into the river even so low down as the present outfalls would flow "upwards to a distance far above the City bridges. If at those times the tem-"perature of the water rose above 66° Fahrenheit, and the rain-fall was less than "usual, the river would undoubtedly become offensive."—Dr. Letheby, F.R.S., Report of the Sanitary Condition of the City of London for 1864.

" ing in many places to 50°; and for its cold nights. " At the end of the month pastures were mostly bare, " many ponds and wells were dried up, and in many " localities water was sold from one penny to threepence " per bucket."*

Influence on health.

The character of the season was most unfavourable to the public health. The mortality of the metropolis was greater than in any preceding summer since the cholera year 1854. 18,000 deaths were registered in London, being at the rate of 2·40 per cent. The average death-rate is 2·25 per cent. Diarrhœa was extremely prevalent, causing 2,210 deaths. Many cases of fever existed, of which about 1,000 were fatal. It seems fairly established that our finest summers are also the most unhealthy; and that when the season is noted for superabundance of rain and want of sunshine, it is also distinguished for a low rate of mortality. In 1860 the weather was very bad, but the death rate was the lowest on record, in marked contradistinction to the present year when the mortality in England was higher by 23,000, in consequence, as it would appear, of the deficiency of moisture, and the wide extremes of temperature.

Remarks on sickness in third quarter.

The sick list in the Customs was heavy during the period, much more than in the corresponding quarters of the four previous years, and nearly approaching the high figures of the six years preceding 1860, when the number of cases was stated as ranging from 132 to 212. Bowel complaints and kindred disorders were common, forming 28 per cent. of the admissions to the list. But, although numerous, they were mostly of light and remediable character, and the time lost by sickness from this cause was only 10 per cent. of the whole. Chronic pulmonary diseases continued to show the highest figures in the time table; but there also occurred an unusual proportion of zymotic disease. Examples were found of all the ordinary forms of fever, and some of the cases were of great severity. The daily sick list thoughout the quarter gave an average of 26; the mean duration of each case was 16 days. The corresponding numbers of the two previous years were, for 1863, 16 daily sick list, and 14 days mean duration; for 1862, 17 daily number, and 13 days duration.

Death from fever.

Only one death took place in this quarter. A young

* Remarks on the Weather (Registrar-General's Report), by James Glaisher, Esq., F.R.S.

waterman fell a victim to typhus fever. How he contracted this, in the Customs, rare disease, is open to doubt. But his house was situated in the fields of East Rotherhithe, near the Commercial Dock Railway Station, where at all times, and more especially in summer, the air is polluted with most offensive exhalations. Two persons in the same house had the disease subsequently; and in that district, as all along the southern bank of the Thames, there was at this time, a great deal both of typhus and typhoid fever among the general population. The former type, as is well known, generally originates in over-crowding, filth, and defective ventilation, and is propagated by personal contagion. The latter is most often traceable to the noxious effluvia thrown off by decaying organic matter, is local in its origin, and less prone to spread. But in too many dwellings of the suburbs of London the conditions requisite for fostering both of these dire scourges are in full force. They are more readily evoked, and their deleterious action is intensified in a dry season like this; and, had the temperature been higher, they would in all probability, have had a wider and more destructive range of operation.

No case of superannuation occurred in this quarter.

Accidental death.

An out-door officer was drowned, while on duty, by falling from a barge in the dark.

TABLE IV.

FOURTH QUARTER (London).

From 1st of October to 31st of December 1864.

	Diseases.	Remained from last Return.	Admissions to Sick List.				Number of Days' Sickness.
			Out-door Officers.	Watermen.	Messengers, &c.	Total.	
1	Intermittent Fever	1	1	1	–	2	85
	Typhoid Fever	2	1	–	1	2	270
	Febricula	–	2	–	–	2	11
	Measles	1	–	–	–	–	16
2	Catarrh	–	20	4	–	24	149
	Cynanche	2	7	1	2	10	125
	Influenza	–	3	1	–	4	47
	Bronchitis	1	2	–	–	2	146
	Pneumonia	1	–	–	–	–	49
	Phthisis	1	1	1	–	2	146
	Asthma	–	–	1	–	1	55

TABLE IV.—*cont.*

	Diseases.	Remained from last Return.	Admissions to Sick List.				Number of Days' Sickness.
			Out-door Officers.	Watermen.	Messengers, &c.	Total.	
3	Dyspepsia	–	2	1	–	3	12
	Diarrhœa	–	9	2	1	12	54
	Colic	–	–	1	–	1	12
	Hæmatemesis	1	–	–	–	–	30
	Hæmorrhoids	–	1	–	–	1	24
	Hepatitis	–	1	–	–	1	36
4	Rheumatism	–	14	6	2	22	315
	Gout	1	–	–	2	2	109
	Pleurodynia	–	1	1	–	2	23
5	Phlegmon	1	6	1	–	7	47
	Abscess	2	4	1	1	6	91
	Bubo	1	–	–	–	–	5
	Whitlow	–	1	–	–	1	7
	Ulcer	–	4	1	–	5	59
	Erysipelas	–	1	–	1	2	62
	Herpes	–	–	–	3	3	27
	Herpes Zoster	–	2	–	–	2	10
	Scabies	–	1	–	–	1	6
6	Fracture	–	1	–	–	1	54
	Contusion	–	6	–	–	6	51
	Sprain	–	1	1	–	2	11
	Wound	1	4	–	–	4	53
7	Vertigo	–	–	–	1	1	6
	Tremor	–	2	–	–	2	8
	Neuralgia	–	3	–	–	3	17
	Ophthalmia	–	1	–	–	1	3
	Fistula lachrymalis	–	1	–	–	1	8
	Otalgia	–	1	1	–	2	16
	Disease of Heart	–	–	1	–	1	34
	Palpitation	–	1	–	–	1	25
	Angina	–	1	–	–	1	6
	Secondary Syphilis	–	1	–	–	1	60
	Stricture	–	1	–	–	1	16
	Dysuria	–	1	–	–	1	11
	Cancer (stomach)	–	1	–	–	1	80
	Debility	1	3	–	–	3	33
		17	113	26	14	153	2,525

Meteorology of fourth quarter.

The beginning of October was cold. Alternate periods of cold and warm weather marked the quarter throughout. The extremes observed were considerably apart, viz., 17° and 67°, but the average temperatures of the months varied little from the mean. That of October was 50°; of November, 42°; of December, 38°. The mean of the whole quarter was 43°·7. The atmospheric pressure averaged 29·72 inches. The rain-fall amounted to but 4 inches, being 3 inches below the average. In October there was little, and in December scarcely any

rain. On the 17th and 18th of December a fall of snow was general throughout the country, and the temperature was 15° below the average. Fogs were prevalent. The mean temperature of the dew point was 38°·7, being 2°·5 below the average. The water of the Thames ranged from 40° to 52°. Extreme dryness was characteristic of this as of all the other quarters of this remarkable year. The mortality of London continued to be high, being at the rate of 26 per 1,000, which has rarely, if ever, been exceeded at this season.

Remarks on sickness in fourth quarter.

The amount of sickness among the Customs' officers was unusually great. In no corresponding period since the year 1857 had there been so many admissions to the sick list. The mean daily number of non-effectives was 27, and the average duration of their illness was 16 days. The out-door officers and messengers contributed proportionally a larger share to the list than the watermen. Severe and protracted cases were more than ordinarily numerous. Three cases extended over the whole quarter, and twenty-five were more than a month under treatment; this will account for about half of the large daily list. Pulmonary and rheumatic complaints constituted the larger portion of sickness. To these were added an unusual number of disorders of the skin and cellular tissue, as erysipelas, abscess, eruptions, and the like. The sudden vicissitudes of temperature brought the ordinary accession of trivial cases of catarrh and quinsey, which always form a considerable portion of the list in the winter months.

Deaths.

Three deaths occurred in the quarter. An out-door officer, who had been suffering for many months from phthisis; another, who had organic disease (soft cancer) of the stomach, and a waterman, who had old standing valvular disease of the heart. They had all, by reason of those maladies, been incapacitated for a long while for duty, and their cases had presented a hopeless aspect from an early period.

Superannuation.

An out-door officer was superannuated in the quarter for urinary calculus and chronic inflammation of the bladder. Repeated operations, both for crushing and extracting the stone, had been performed (at Guy's Hospital), but without permanent relief, and he had been more than twelve months under treatment before he retired from the service.

Table V.

Summary of the preceding Tables, including the whole Year 1864. (London.)

	Diseases.	Remained from last Year.	Admissions to Sick List.				Number of Days' Sickness.
			Out-door Officers.	Watermen.	Messengers, &c.	Total.	
1	Intermittent Fever	–	5	4	–	9	248
	Remittent Fever	–	–	–	1	1	41
	Typhus Fever	–	1	1	–	2	76
	Typhoid Fever	–	2	1	2	5	367
	Febricula	–	9	2	1	12	79
	Measles	–	–	–	1	1	19
	Chicken-pox	–	1	–	–	1	12
2	Catarrh	1	67	16	3	86	655
	Cynanche	–	24	6	5	35	295
	Influenza	–	3	1	–	4	47
	Bronchitis	–	9	4	3	16	537
	Pneumonia	1	3	1	1	5	236
	Pleuritis	–	1	1	–	2	98
	Phthisis	4	4	1	1	6	1,095
	Hæmoptysis	–	2	–	–	2	15
	Asthma	–	1	3	1	5	170
3	Dyspepsia	–	14	1	1	16	79
	Diarrhœa	–	37	13	2	52	312
	Dysentery	–	1	–	–	1	36
	Colic	–	5	2	–	7	66
	Hæmatemesis	–	2	–	–	2	41
	Hæmorrhoids	–	3	–	–	3	34
	Hepatitis	–	5	–	–	5	104
	Jaundice	–	–	1	–	1	14
4	Rheumatism	5	38	20	6	64	1,381
	Gout	–	5	–	4	9	173
	Pleurodynia	–	4	2	1	7	92
5	Phlegmon	–	22	4	–	26	233
	Abscess	1	8	2	1	11	173
	Fistula	–	1	1	–	2	25
	Bubo	–	–	1	–	1	142
	Gum-boil	–	1	–	–	1	2
	Whitlow	–	1	–	–	1	7
	Ulcer	1	8	3	1	12	170
	Erysipelas	–	3	1	1	5	116
	Urticaria	–	1	–	–	1	2
	Herpes	–	–	–	3	3	27
	Herpes Zoster	–	4	–	–	4	32
	Scabies	–	3	–	–	3	23
6	Fracture	–	1	–	–	1	54
	Sprain	–	3	4	1	8	94
	Contusion	2	18	3	1	22	174
	Wound	–	9	4	–	13	208
	Scald	–	2	–	–	2	17
	Injury of Eye	–	1	–	–	1	6
	Spinal Concussion	–	–	1	–	1	61

TABLE V.—*cont.*

Diseases.	Remained from last Year.	Admissions to Sick List.				Number of Days' Sickness.
		Out-door Officers.	Watermen.	Messengers, &c.	Total.	
Cephalalgia	–	3	2	–	5	35
Vertigo	–	1	–	1	2	27
Neuralgia	1	6	–	–	6	49
Tremor	–	5	1	–	6	41
Epilepsy	–	1	–	–	1	7
Ophthalmia	1	6	–	–	6	37
Cataract	–	1	–	–	1	36
Fistula Lachrymalis	–	1	–	–	1	8
Otalgia	–	1	1	–	2	16
Disease of Heart	–	–	2	–	2	52
Palpitation	–	1	–	–	1	25
7 Angina	–	3	–	–	3	43
Syphilis	–	1	–	–	1	22
Syphilis (secondary)	–	1	–	–	1	60
Orchitis	–	2	–	1	3	24
Hydrocele	–	2	–	–	2	17
Varicocele	–	1	–	–	1	3
Stricture	–	1	–	–	1	16
Dysuria	–	2	–	–	2	18
Albuminuria	–	1	–	–	1	68
Urinary Calculus	1	–	–	–	–	274
Cancer	1	1	–	–	1	86
Diseased Knee-Joint	1	–	–	–	–	90
Debility	–	5	–	–	5	47
	20	378	110	43	531	8,989

From this summary of the medical history of the force in London during the year, it appears that the amount of sickness has been unusually great. The excess, as compared with the preceding year, is nearly 20 per cent., and has extended to all classes, but, as the following figures show, in an unequal degree.

Numerical results.

Mean daily number non-effective.

Out-door officers	18 = 2·9	per cent.
Watermen	4 = 2·4	,,
Messengers, &c.	2 = 2·7	,,
Total	24 = 2·8	,,

Ratio of cases of sickness.

Out-door officers	61	per cent. on strength.
Watermen	69	,,
Messengers, &c.	60	,,
Total	62·2	,,

Mean duration of each case.

Out-door officers	-	18 days.
Watermen -	-	13 „
Messengers, &c.	-	18 „
Total -	-	17 „

Loss of time through sickness.

Out-door officers -	-	11 days.
Watermen - -	-	8·7 „
Messengers, &c. -	-	10·5 „
The whole force per man	-	10·5 „

Deaths.

Out-door officers	-	5 = 0·8	per cent.
Watermen -	-	2 = 1·1	„
Messengers, &c.	-	0 = 0	„
Total	-	7 = 0·82	„

Superannuations.

Out-door officers	-	2 = 0·3	per cent.
Watermen		1 = 0·6	„
Messengers, &c.	-	0 = 0	„
Total	-	3 = 0·38	„

The mortality, therefore, and superannuation in the force are below the average of previous years, as the following table will show more distinctly :—

	1857.	1858.	1859.	1860.	1861.	1862.	1863.	1864.
Deaths (exclusive of accident)	12	11	11	5	11	11	9	7
Superannuations -	9	11	14	27	6	6	2	3

In only one year have the deaths been fewer than in this, viz., in 1860, but, as will be observed, the superannuations were very numerous, all the more unpromising or doubtful lives having in that year been eliminated from the service.

Health of the messengers, &c.

No instance of death or superannuation in the class of messengers has to be recorded for this year. They are, it is true, but a small body of men, 74 in number, but many of them are far advanced in life, and, what is more worthy of note, there has been during the period a much larger proportion of the increase of sickness in this than in either of

the other classes. Last year the time lost by the messengers on account of illness was only 5 days per man, while in this year it has been upwards of 10 days. This increase is mainly due to the occurrence of some severe and protracted cases of fever, pulmonary disease and rheumatic gout among them. When stricken with disease they are, from their age, longer in recovering than the more active and vigorous men of the other departments.

Health of the watermen.

The health of the watermen has been, as usual, very satisfactory. Notwithstanding the notorious insalubrity of the year and the exposure and hard work those officers are exposed to, the rate of sickness has exceeded by very little that of the previous year. In 1863 each man lost 8 days, in 1864 8·7 days. Cases of sickness were more numerous, but did not so long disable them from duty. Ague, asthma, rheumatism, and some severe accidents are the only points in which the watermen exhibit higher numbers. Two deaths occurred in this class, one from typhus fever, and one from disease of the heart. An elderly man long afflicted with rheumatism was superannuated.

Health of the out-door officers.

The out-door officers contribute as hitherto, the largest share to the sick list. The daily number non-effective was 18, as against 15·4 in the preceding year; and the time lost was 11 days per man, as against 9·3 days. Besides a greater proportion of ordinary sickness, there was throughout the year an unusual number of prolonged cases of phthisis and other slowly wasting maladies, some of which were permitted to remain on the books much longer than the prescribed time. Fevers, acute inflammations of the chest, erysipelas and other skin diseases give higher rates than usual. The only redeeming feature of the year was the low mortality, which was 5, and the equally low superannuation 2; the average of preceding years being 7 and 8 respectively. The deaths were caused by long standing diseases of hopeless character, viz., consumption and cancer. The retirements also were cases of a tedious and intractable kind, which had long been on the list.

Health of those employed on barge duty.

One subdivision of the out-door officers, viz. those employed on general duty, and chiefly in barges on the river have longer hours, a larger share of night work, and are more exposed to the weather than the others. It therefore becomes necessary, as in the case of the watermen, to place them on the sick list for minor ailments, by which in more favourable circumstances, they might not be al-

together incapacitated. The ratio of admissions in this section of the force is always high, although the aggregate of sickness may not be greater than in other out-door officers whose powers of endurance are less tried. From a list furnished by the registrar, it appears that, in the past year, 84 officers had been engaged on "general duty." Of these 28 had never been absent through illness. The remaining 56, show an absence of 15 days per man. But when all are taken into account, we find that the percentage of non-effectives was 2·3 per diem and that the time lost by sickness throughout the year was 10·3 days. On referring to the preceding page these figures are seen to be below the average. No death from disease is recorded as occurring in this subdivision of the force; one of their number was accidentally drowned, and this is a risk to which in the dark winter nights and dense fogs of the river they are particularly liable.

Recent improvements in the condition of Customs officers in relation to their health, &c.

In the reports of the two previous years the relations of the duties of the various classes of officers, as bearing on their health, were touched on at considerable length. In some minor matters of detail the duties and amount of exposure have been lightened, and the time of rest extended. But the chief advantage the out-door officers have derived in the year, is the substitution of a fixed salary for day pay, which was stopped in case of sickness. Although this stoppage for several years has not been more than one shilling a day, the recent change, through which the annual salary is increased by that amount, and no deduction is made for absence on leave, or on account of sickness, has unquestionably been a great boon to those concerned. Instances were not wanting of meritorious officers, who had families to support, persisting in attendance on duty, to the great detriment of their health, rather than forego the day pay, which formed no inconsiderable portion of their income. Moreover, in cases of protracted illness, there was often a necessity for more delicate food, stimulants, &c., which their diminished resources could ill afford them to procure without trenching seriously on the ordinary comforts of their homes. But, as in all bodies of men, there are persons whose sense of obligation is feeble, and who are too apt to evade duty as often as they can, and occasionally on inadequate grounds, as soon as the new system of payment came into operation,*

* June 1, 1864.

a marked tendency was perceived on the part of some, if not to simulate, at least to exaggerate, comparatively trivial illness, with a view to absent themselves from their daily labour. The temptation is still greater, when, as frequently happens, they are members of some club or mutual benefit society. If an officer can obtain from such a source 10 or 15 shillings a week, in addition to his usual income, and at the same time escape irksome and fatiguing duty, and long exposure to the weather, he has no small inducement to hand in a "sick note" on slight pretexts. Greater stringency became necessary in regard to the admission to the sick list, both of those who presented themselves personally, and still more of those who sent intimations of illness from their residences. The efficient surveillance of men who live scattered over the wide extent of London is by no means easy, and domiciliary visits were much more frequent than the urgency of the cases, in a medical point of view, required. The propensity to take undue advantage of the new arrangement has been thus to a great extent repressed. While unwilling to detract in any degree from the well-known merits and proved diligence of the general body of the inferior officers, I consider it my duty to advert to the fact, that some indolent and unscrupulous members of the force have sought to avail themselves of the important privilege which has been recently bestowed, in a humane and liberal spirit, on the really deserving and distressed.

Proportion of various classes of disease.

In last year's Report a table was introduced, exhibiting the ratio in which the various classes of disease occurred, one column giving the proportional number of cases, the other showing the proportion of time lost. That for 1864 differs in some respects from it.

Table VI.

Classes of Disease arranged as in the preceding Tables.	Per-centage on Admissions to Sick List.	Per-centage on Time lost by Illness.
1. Fevers (including Eruptive Fevers)	5·8	9·4
2. Diseases of the Respiratory Organs	30·3	35·1
3. Diseases of the Digestive Organs	16·3	7·6
4. Rheumatism and Gout	15·0	18·0
5. Diseases of the Skin and Cellular Tissue	13·2	10·5
6. Accidental Injuries	9·3	7·1
7. Other diseases, *vide* Summary, Table V.	10·1	12·3
	100·0	100·0

For while there has been a considerable increase in affections of the respiratory organs and febrile diseases, the diminution in the number and duration of cases of diarrhœa and other maladies of the digestive organs, is very marked. These latter constitute less than 8 per cent. of the whole, when viewed in regard to time lost. Accidents also have caused little loss of time, 7 per cent. On the other hand, pulmonary affections and rheumatism give together no less than 53 per cent., and fevers show the unusually large proportion of nearly 10 per cent. Reference has already been made to the prevalence of typhus and typhoid fever, cases of which occurred to the force in widely distant quarters of the town, and could not always be traced to any specific cause. Some skin diseases, for example, Herpes zoster, were found in greater number than in ordinary years. The daily attendance of patients was very large, considerably exceeding the number on the sick list, for, high as it was, there are invariably many cases under treatment and occasional inspection, of such a nature as not to demand withdrawal from duty. A table is appended, as usual, of the visits to officers at their houses; but the figures are somewhat understated, from the circumstance that several visits made during my absence on leave are not recorded.

Difference from that of last year.

TABLE VII.

VISITS to Inferior Officers of the Customs, when on the Sick List, at their own Residences, in 1864.

District.	No. of Visits.
In Stepney - - - - -	501
„ Mile End and Bethnal Green - -	278
„ Limehouse, Poplar, and Barking Road -	175
„ Shadwell - - - -	154
„ Bow, Hackney, Old Ford, Victoria Park	98
„ Rotherhithe, Deptford, Blackheath, &c. -	91
„ Bermondsey and Southwark - -	56
„ Peckham and Camberwell - -	47
„ Hoxton, Dalston, Islington - -	46
„ Marylebone, Camden Town, Regent's Park.	27
„ Kennington, Lambeth, Pimlico - -	15
Within a mile of the Custom House, Whitechapel, Wapping, and City.	84
Total - - - -	1,572

The Gravesend Officers.

In this division of the force the unhealthiness of the year was as conspicuous as in that stationed in London. The few salient points of difference are clearly exhibited in the Tables (X. to XIV. inclusive). While the number of cases is proportionally higher, their average duration is considerably less. Bowel complaints and kindred disorders are more common, while fever and rheumatism are less frequent than in the London force. In spring a case of small-pox occurred in an out-door officer, who stated he had been on board a vessel where the disease existed. He had been vaccinated, and in a few weeks he recovered satisfactorily. Two deaths from disease are recorded. In one, a waterman, the chief symptoms were excruciating pains in the head and face persisting over several months, and subsequently convulsions. All treatment was unavailing, and the fatal termination is ascribed by Dr. Russell to "chronic inflammation and suppuration of the "brain." The other, an out-door officer, had been long given to intemperance. He had occasionally suffered from dyspepsia and liver complaint, and was on the sick list for catarrhal symptoms, when he was rapidly carried off by an attack of delirium tremens. An out-door officer was accidentally drowned at night in the London Docks, and another committed suicide.

No instance of superannuation is noted at Gravesend in this year.

The health statistics of this department may be expressed thus:—

Mean daily number on list = 12, being equal to 4 per cent. on strength.

Ratio of admissions to sick list = 168 per cent. on strength.

Mean duration of each case = 9·3 days.

Loss of time per man = 15·6 days.

Deaths from disease, two in number, = 0·75 per cent.

Deaths from violence or accident, two in number, = 0·75 per cent.

Deaths in all, four in number, = 1·5 per cent.

A comparison with former years is exhibited:—

	1857.	1858.	1859.	1860.	1861.	1862.	1863.	1864.
Deaths (exclusive of accidents)	2	0	3	1	1	1	4	2
Superannuations	0	1	0	2	1	1	1	0

TABLE VIII.

DEATHS IN 1864.

Name.	Rank.	Age.	Service.	Date of Death.	Cause of Death.
			Yr. Mo.		
J. McMaster - -	Out-door officer, London.	53	26 1	Jan. 7	Cancer of lumbar glands.
J. Harrowsmith -	Do. Gravesend	38	8 9	„ 30	Accidentally drowned.
J. Race - -	Do. London -	37	10 0	„ 31	Pulmonary consumption.
T. H. Foule - -	Do. Gravesend	32	9 2	Mar. 14	Suicide.
A. Townshend -	Do. London -	50	21 7	Apr. 27	Pulmonary consumption.
W. J. Hayward -	Waterman, Gravesend.	39	19 8	July 8	Chronic inflammation of brain.
R. Heard - -	Out-door officer, London.	26	6 4	„ 27	Accidentally drowned.
T. W. Gaston -	Waterman, London.	23	3 0	Sept. 30	Typhus fever.
R. Tutty - -	Out-door officer, London.	30	6 8	Oct. 10	Pulmonary consumption
J. R. Hollingum -	Waterman, London.	37	14 1	Nov. 7	Disease of heart.
E. Taylor - -	Out-door officer, Gravesend.	47	21 1	„ 11	Delirium tremens.
N. G. Hurst - -	Do. do. - London.	52	21 4	Dec. 22	Cancer of stomach.

TABLE IX.

SUPERANNUATIONS IN 1864.

Name.	Rank.	Age.	Length of Service.	Date of Superannuation.	Cause of Superannuation.
			Yr. Mo.		
W. Atkins - -	Waterman, London.	59	39 1	Feb. 20	Chronic rheumatism and debility.
J. Attwooll - -	Out-door officer, London.	50	30 4	June 14	Do. do.
G. B. Cook - -	Do. do.	54	25 0	Nov. 19	Urinary calculus and chronic inflammation of the bladder.

The five following tables demonstrate the leading forms of disease and the number of cases, as well as the time lost through sickness in London and at Gravesend. In four the details of each quarter are given in a form condensed from the periodical returns (*vide* Tables I. to IV.). The last shows a classified summary of the medical history of the whole year, and includes the entire force.

TABLE X.

LEADING Forms of Disease, and Time lost through Sickness in the First Quarter.

Classes of Disease.	In London.		At Gravesend.		Total.	
	Number of Cases.	Days' Sickness.	Number of Cases.	Days' Sickness.	Number of Cases.	Days' Sickness.
1. Fevers (including Eruptive Fevers).	8	72	3	46	11	118
2. Disorders of the Respiratory Organs.	51	940	54	423	105	1,363
3. Disorders of the Digestive Organs.	12	120	35	153	47	273
4. Rheumatism and Gout -	17	608	20	157	37	765
5. Skin Disease, Ulcers, Abscess, &c.	13	187	9	52	22	239
6. Accidental Injuries -	14	250	9	78	23	328
7. Other Diseases (*vide* Table I.)	11	302	24	284	35	586
	126	2,479	154	1,193	280	3,672

TABLE XI.

LEADING Forms of Disease and Time lost through Sickness in the Second Quarter.

Classes of Disease.	In London.		At Gravesend.		Total.	
	Number of Cases.	Days' Sickness.	Number of Cases.	Days' Sickness.	Number of Cases.	Days' Sickness.
1. Fevers (including Eruptive Fevers).	8	160	2	37	10	197
2. Disorders of the Respiratory Organs.	31	645	30	352	61	997
3. Disorders of the Digestive Organs.	16	142	31	174	47	316
4. Rheumatism and Gout -	17	306	18	128	35	434
5. Skin Disease, Ulcer, Abscess, &c.	12	172	14	115	26	287
6. Accidental Injuries -	13	128	5	130	18	258
7. Other Diseases (*vide* Table II.)	10	239	13	211	23	450
	107	1,792	113	1,147	220	2,939

Table XII.

Leading Forms of Disease and Time lost through Sickness in the Third Quarter.

Classes of Disease.	In London.		At Gravesend.		Total.	
	Number of Cases.	Days' Sickness.	Number of Cases.	Days' Sickness.	Number of Cases.	Days' Sickness.
1. Fevers (including Eruptive Fevers).	9	228	6	111	15	339
2. Disorders of the Respiratory Organs.	36	846	31	253	67	1,099
3. Disorders of the Digestive Organs.	41	256	37	192	78	448
4. Rheumatism and Gout -	20	285	15	62	35	347
5. Skin Disease, Ulcers, Abscess, &c.	18	380	16	154	34	534
6. Accidental Injuries -	8	162	9	103	17	265
7. Other Diseases (*vide* Table III.)	13	236	18	189	31	425
	145	2,393	132	1,064	277	3,457

Table XIII.

Leading Forms of Disease and Time lost through Sickness in the Fourth Quarter.

Classes of Disease.	In London.		At Gravesend.		Total.	
	Number of Cases.	Days' Sickness.	Number of Cases.	Days' Sickness.	Number of Cases.	Days' Sickness.
1. Fevers (including Eruptive Fevers).	6	382	2	57	8	439
2. Disorders of the Respiratory Organs.	43	717	37	407	80	1,124
3. Disorders of the Digestive Organs.	18	168	5	35	23	203
4. Rheumatism and Gout -	26	447	6	98	32	545
5. Skin Disease, Ulcers, Abscess, &c.	27	314	16	283	43	597
6. Accidental Injuries -	13	174	5	54	18	228
7. Other Diseases (*vide* Table IV.)	20	323	9	166	29	489
	153	2,525	80	1,100	233	3,625

TABLE XIV.

THE leading Forms of Disease, the Number of Cases entered on the Sick List, and the Number of Days they were under Treatment during the Year 1864.

Classes of Disease.	In London.		At Gravesend.		Total.	
	No. of Cases.	Days' Sickness.	No. of Cases.	Days' Sickness.	No. of Cases.	Days' Sickness.
1. Fevers (including Eruptive Fevers).	31	840	13	251	44	1,091
2. Disorders of the Respiratory Organs.	161	3,148	152	1,435	313	4,583
3. Disorders of the Digestive Organs.	87	686	108	554	195	1,240
4. Rheumatism and Gout -	80	1,646	59	445	139	2,091
5. Skin Diseases, Ulcer, Abscess, &c.	70	952	55	604	125	1,556
6. Accidental Injuries -	48	614	28	365	76	979
7. Other Diseases (*vide* Table V.)	54	1,103	64	850	118	1,953
Total - -	531	8,989	479	4,504	1,010	13,493

The general results are these :—

The average daily number on the sick list has been 37 or 3·2 per cent. on mean strength.

The ratio of admissions to list = 87 per cent. on strength.

The mean duration of each case = 13·3 days.

The time lost through sickness has been 11·7 days per man.

The deaths 12 in number, give the ratio of 1 per cent.; deducting the three deaths from casualty, the proportion is somewhat less than 8 per 1,000 of strength. In 1863 it exceeded 11 per 1,000.

The superannuations have been only three, and give the proportion of 2·6 per 1,000, precisely the same ratio as in last year.

WALTER DICKSON, M.D.

April 1865.

LONDON:
Printed by GEORGE E. EYRE and WILLIAM SPOTTISWOODE,
Printers to the Queen's most Excellent Majesty.
For Her Majesty's Stationery Office.

NINTH REPORT

OF THE

COMMISSIONERS OF HER MAJESTY'S INLAND REVENUE

ON

THE INLAND REVENUE.

Presented to both Houses of Parliament by Command of Her Majesty.

LONDON:
PRINTED BY GEORGE E. EYRE AND WILLIAM SPOTTISWOODE,
PRINTERS TO THE QUEEN'S MOST EXCELLENT MAJESTY.
FOR HER MAJESTY'S STATIONERY OFFICE.

1865.

13095.

NINTH REPORT.

TO THE LORDS COMMISSIONERS OF HER MAJESTY'S TREASURY.

MAY IT PLEASE YOUR LORDSHIPS,

We have the honour to present our Report on the Revenue under our management, for the financial year ended on the 31st March 1865.

It will be seen in the following pages that the progressive increase of revenue, which it has hitherto been our good fortune almost invariably to notice in our annual statements, has not failed to show itself in the year now under review; for, notwithstanding a diminished receipt of income tax to the exent of 1,116,221*l.*, of fire insurance duty to the extent of 61,038*l.*, and a loss of 26,000*l.* in tea dealers' licences (all of which were occasioned by reduction of taxation), the revenue collected by this Department in the year 1864–5 was greater by 161,246*l.* than the revenue of the previous year.

EXCISE DUTIES.

NET RECEIPTS in the Years ended 31st March 1864 and 1865.

Duties.	Year ended 31st March		Increase.	Decrease.
	1864.	1865.		
	£	£	£	£
Spirits - -	9,692,515	10,176,731	484,216	—
Malt -	6,092,736	6,394,553	301,817	—
Hackney Carriages -	98,121	102,647	4,526	—
Stage Carriages -	128,475	129,178	703	—
Railways - -	403,626	439,332	35,706	—
Licences - -	1,979,135	2,144,403	165,268	—
Race Horses -	7,288	7,746	458	—
Chicory - -	7,211	10,463	3,252	—
Sugar (home-made) -	—	39	39	—
„ used in brewing	—	4,544	4,544	—
	18,409,107	19,409,636	1,000,529	—

SPIRITS.

Number of gallons charged in 1863–4 -	20,231,126	
„ „ on which drawback was paid for exportation and methylation -	807,680	
Consumed as beverage in the United Kingdom - - - -	—	19,423,446
Number of gallons charged in 1864–5 -	21,238,862	
„ „ on which drawback was paid for exportation and methylation -	869,018	
Consumed as beverage in the United Kingdom - - - -	—	20,369,844
Increase in consumption - -	—	946,398

If we speak with satisfaction of a large consumption of spirits, we feel that we are open to the reproach of taking a narrow view of the subject.

Without pausing to consider whether we have not more reason than may at first appear for congratulating your Lordships on a statement which testifies so unequivocally to the prosperous condition of the labouring classes, we would remind those who might take alarm at the increased sale of intoxicating liquors, that the quantity consumed is now very considerably less than it was some years ago, before the duties were raised, and that this diminution is still more apparent when it is viewed in relation to the population at the two periods.

Comparison of consumption in 1852 and 1864.

The year 1852 was the last before those alterations in the rates of duty commenced which terminated in 1860 in a uniform rate of 10*s.* throughout the kingdom, and we may, therefore, select that year for our comparison.

Now the consumption in 1852, exclusive of the spirits used in arts and manufactures (which are now supplied by methylated spirits), was 25,000,000 gallons, or nine-tenths of a gallon per head of the population at that time. The present consumption of 20,369,844 gallons is but little more than six-tenths of a gallon per head, and yet there is an increase of nearly four millions in the revenue.

Population of the United Kingdom, 1852, 27,500,000; 1864, 29,657,000.

If the former average consumption were to prevail now, the net revenue would be raised to the enormous sum of 13,337,450*l.*

It would not be fair to keep out of sight the extent to which foreign and colonial spirits have been consumed in this country in the same period; but even if we add these to our account we find a decrease in the whole in

1864, as compared with 1852, of 3,349,729 gallons, the amount in the former year being 26,516,531 and in the latter 29,866,260 gallons, which is at the rate of almost 1 gallon and one-tenth per head of population in 1852 and not quite nine-tenths of a gallon in 1864.

In the case of wine and beer, the comparison for the same years gives the following results:

WINE.

Consumption in 1852		6,346,061 gals.	per head of population ·23 of a gallon.
„	1864	11,457,146 „	per head of population ·38 of a gallon.
Increase - -		5,111,085	

BEER.

Consumption in 1852		16,732,484 barrels.	per head of population ·6 of a barrel.
„	1864	22,037,902 „	per head of population ·7 of a barrel.
Increase - -		5,305,418	

All these facts point to the same conclusion. They are undeniable evidence in favour of the increase of the duty on spirits, which have thus been made to yield a larger revenue with a diminished consumption. By the operation of the same measure an impetus has been given to the substitution of milder stimulants for ardent spirits, which appears likely to be the commencement of a desirable change in the habits of the population.

In Ireland more especially is a taste for beer making progress, and there can be no doubt that it must be fostered and promoted by the high price of spirits.

The following account of consumption is, we believe, very nearly accurate:—

Consumption per head of population.

England -	1852 -	·85 of a barrel.	
„ -	1864 -	·95 „	
Increase 11·7 per cent.			
Scotland -	1852 -	·20 of a barrel.	
„ -	1864 -	·32 „	
Increase 60 per cent.			
Ireland -	1852 -	·09 of a barrel.	
„ -	1864 -	·20 „	
Increase 122 per cent.			

METHYLATED SPIRITS.

Year ended 31st March.	Gallons of Spirits Methylated.
1864	863,748
1865	933,649

A German chemist has recently introduced a process by which wood naphtha may be so far purified as to be available for drinking purposes; if not alone and unmixed, at all events in combination with flavoured compounds.

As this spirit is not produced by fermentation, there appeared to be some doubt whether the maker of it could be brought within the operation of the existing revenue laws, but it was quite clear that, whatever might be the mode of its production, it ought to be subject to the same duty as other spirits, for which it could be used as a substitute, and your Lordships have accordingly introduced a bill for that purpose.

We trust that this measure may be sufficient to protect the revenue, for it would indeed be a serious evil were it to become necessary to withdraw the permission to use spirits duty-free when combined with wood naphtha.

ILLICIT DISTILLATION.

NUMBER OF DETECTIONS.

	England.	Scotland.	Ireland.
Year ended 31st March 1864:			
Distillation only - -	63	18	2,744
Removing spirits without permit - - - -	21	1	13
	84	19	2,757
Year ended 31st March 1865:			
Distillation only - - -	38	9	3,452
Removing spirits without permit - -	19	—	5
	57	9	3,457

The extent to which illicit distillation still prevails in Ireland is a subject for regret, but not for surprise, the same causes which we referred to in our report of last year being still in operation. We do not believe that the legitimate trade of the distiller has been affected by it. The counties of Donegal, Sligo, Galway, and Mayo, which are some of the poorest and wildest districts in Ireland, are those in which smuggling appears to be concentrated.

So far as we can learn, the illicit spirit is made for the supply of the local population alone, and does not find its way into the great towns. The consumers are those who are too poor to buy the duty-paid spirit, and, therefore, although we deplore the existence of the practice, we consider it scarcely worth notice as affecting the revenue. Certain it is that all the distilleries have been fully at work, and that the prices have been remunerative to the legal manufacturer.

MALT.

NUMBER of BUSHELS charged with Duty.

	Number of Bushels.
Year ended 31st March 1864 - -	47,935,949
„ „ 1865 - -	48,538,412
Increase - -	602,463

As the quantity of malt made in 1863 was, by more than 2¼ million bushels, greater than in any previous year, and as the stocks on hand at the close of the season were unusually large, we expected a diminution in the year 1864. Instead of this we have again an increase.

Foreign barley for malting.

We understand that foreign barley has been used for malting to an unusual extent, and that this is not merely on account of the inadequacy of the supply of English barley, but also because the colour or quality of some of the foreign barleys recommend them to the brewers of a certain class of ales.

Large stocks of malt.

The stocks of malt at present on hand are very large. Some maltsters were compelled to cease working before the usual period, for want of store room, and it is a fact that we have received this Spring more than one application

for remission of duty on malt which has been destroyed or injured by the falling in of the over-weighted malt-house floors.

There is reason to believe that on the whole there is very little evasion of the malt duty. The detections of fraud have been few and unimportant.

Malt for Cattle.

Twenty-eight persons have made entry of malt-houses for making malt duty-free to be used in feeding animals under the Act of last session.

The quantity made was 10,705 quarters, but only 8,748 quarters were mixed with linseed, and delivered for consumption. Of the remainder part is in store and part has been allowed to be used for brewing on payment of the duty.

Several of these maltsters have given notice that it is not their intention to make cattle-feeding malt again, and it seems probable that less than half the original number will be at work next year.

But it must not be supposed that this is owing to Excise restrictions. On the contrary, the great majority of the gentlemen engaged in this manufacture have done us the justice to acknowledge that they had nothing to complain of on that score, and the objections which were made by the few who were dissatisfied were directed against the regulation requiring that the mixture should be ground to a degree of fineness which we have since considerably modified.

Chicory.

The duty on this substitute for coffee has been 1*l.* 4*s.* 3*d.* per cwt. since the 1st April 1864.

The quantity brought to charge in the year was 5,752 cwts. 3 qrs. 25 lbs., the duty on which amounted to 6,975*l.* 9*s.* 7*d.*

The average quantity brought to charge in the three preceding years was 7,658 cwts., but it would be an error to infer from these figures that the consumption is diminishing.

In fact, the quantity actually dried and prepared for use in this last season was above the average, though it has not all yet been taken out of store. In former years, on the contrary, as the duty was to be raised at the com-

mencement of each financial year, no chicory made before the 31st of March was allowed to remain uncharged so as to be liable to the higher rate. The actual payment of the duty on the quantity thus charged at the end of the year 1863–4 was not made until after the commencement of the succeeding year, a circumstance which must be borne in mind when the account of the receipt of duty is compared with that of the charge.

The consumption of chicory appears to be steadily increasing, as we find that 150 additional acres are to be sown with it this year.

British Sugar.

British-made sugar has for a long time held a merely nominal place in our list of exciseable articles, but during the past year two manufactories of glucose or starch sugar have been established in London.

The quantity brought to charge in the year ending on the 31st of March was 1,064 cwts. 3 qrs. 14 lbs.; duty 496*l.* 18*s.* 10*d.*, of which, however, only 39*l.* was paid within the financial year.

The materials from which this sugar is made are chiefly sago and potato starch. It has but little resemblance to cane sugar, and less sweetness than the lowest class of colonial sugars. The rate of duty with which it has been charged is 9*s.* 4*d.* per cwt., being that on yellow Muscovado or brown clayed sugar.

We are informed that it is intended to be used in brewing.

EXCISE LICENCES.

YEAR ended the 31st March 1865.

—	England.	Scotland.	Ireland.	United Kingdom.	Amount of Duty.
	No.	No.	No.	No.	£
Brewers	37,855	299	107	38,261	332,851
Distillers and Rectifiers	108	131	63	302	3,171
Maltsters	5,470	495	147	6,112	17,181
Auctioneers and Appraisers.	7,246	721	415	8,382	55,452
Dealers in Beer	2,581	76	622	3,279	10,845
„ „ additional licences to retail.	842	—	457	1,299	1,432
„ Spirits	3,710	383	479	4,572	48,006
„ „ additional licences to retail.	1,587	—	—	1,587	4,997
Retailers of Beer (Publicans).	66,830	496	15,404	82,730	176,596
„ Spirits	79,535	12,955	15,443	107,933	567,796
„ Wine	29,418	3,653	4,476	37,547	82,903
„ Beer and Cyder (not Publicans).	48,929	823	—	49,752	145,402
Refreshment Houses	5,151	—	85	5,236	4,222
Dealers in Wine	2,322	57	135	2,514	26,397
Wine Retailers	3,109	1,592	100	4,801	10,142
Sweets	9,774	114	92	9,980	11,496
Packet Boats	209	92	41	342	359
Methylated Spirits	132	34	4	170	424
Stage and Hackney Carriages.	25,999	1,073	—	27,072	16,949
Postmasters	8,499	892	1,888	11,279	152,049
Game	44,104	5,001	3,402	52,507	144,707
Grocers' Spirits (Ireland).	—	—	270	270	2,930
Tobacco Dealers and Manufacturers.	224,101	19,090	22,174	265,365	76,182
Tea Dealers	124,020	18,816	22,736	165,572	65,543
Hawkers	17,123	1,600	13	18,736	49,961
Dealers in Gold and Silver Plate.	6,795	964	388	8,147	24,841
Pawnbrokers	2,699	327	619	3,645	30,728
Makers and Sellers of Playing Cards.	5,898	798	583	7,279	924
Vendors of Patent Medicines.	10,188	734	—	10,922	6,125
Other Licences	1,214	163	159	1,536	4,268
Total	775,448	71,379	90,302	937,129	2,074,879
Licences for fractional parts of a year and surcharges.					84,925
					2,159,804

SUMMARY of the Alterations made in the Excise Duties in the Year 1864–5.

	Former Duties.	Duties for 1864–5.	Act.
Chicory - -	8th June 1863, to 1st April 1864, 1*l.* 1*s.* 9*d.* per cwt.	1*l.* 4*s.* 3*d.* per cwt.	26 Vict. c. 22.
Sugar used in brewing	Revival of duty deferred.	3*s.* 4*d.* per cwt.	27 Vict. c. 18.
Sugar, home-made -	Various - -	Various—Reduced.	Do.
Licences to sell tea, coffee, &c., where the premises are rated to the relief of the poor at less than 8*l.*	11*s.* 6½*d.*	2*s.* 6*d.* Loss of revenue, 26,000*l.*	Do.
Occasional licences to sell wine, beer, tobacco, &c., for periods not exceeding three days.	- - -	Wine or beer, 1*s.* per day. Tobacco or snuff, 4*d.* per day.	Do.
Licences to hawkers trading with more than one horse.	2 horses 12*l.*, and 4*l.* for every additional horse.	2 horses 8*l.*, and 4*l.* for every additional horse.	Do.
Licences to Appraisers, Pawnbrokers, Dealers in Plate, Sellers of Patent Medicines, Sellers of Playing Cards, Hawkers, and Pedlars, and House Agents.	Transferred from Stamp to Excise Revenue.		27 & 28 Vict. c. 56.

STAMPS.

NET RECEIPTS in the Years ended 31st March 1864 and 1865.

	Years ended the		Increase.	Decrease.
	31st March 1864.	31st March 1865.		
	£	£	£	£
Deeds and other Instruments	1,503,817	1,636,784	132,967	—
Bills of Exchange and Promissory Notes.	664,118	769,311	105,193	—
Bankers' Notes - -	2,810	2,157	—	653
Composition for Bankers' Bills and Notes.	127,257	129,003	1,746	—
Receipts, Drafts, and other 1*d.* Inland Revenue Stamps.	477,197	500,249	23,052	—
Probates of Wills and Letters of Administration and Testamentary Inventories.	1,471,651	1,511,161	39,510	—
Legacy and Succession Duty	2,251,581	2,337,994	86,413	—
Fire Insurances - -	1,633,434	1,572,396	—	61,038
Marine Insurances - -	407,695	398,768	—	8,927
Patent Medicines - -	49,849	52,978	3,129	—
Cards - - - -	8,200	8,801	601	—
Probate Court Fee Stamps -	128,002	134,860	6,858	— *
Licences and Certificates -	243,166	131,184	—	111,982 *
Gold and Silver Plate Duty	59,566	62,364	2,798	—
Newspapers - - -	119,987	117,547	—	2,440
Admiralty Court Fee Stamps	9,267	9,808	541	—
Divorce and Matrimonial Causes Fee Stamps.	2,637	2,914	277	—
Patents for Inventions -	110,592	113,579	2,987	—
Land Registry Fee Stamps -	133	411	278	—
Law, Equity, Exchequer, and Chancery Fund (Ireland).	41,957	36,240	—	5,717
Registration of Deeds Fee Stamps (Ireland).	—	3,465	3,465	—
Total - - £	9,312,916	9,531,974	409,815	190,757

Net Increase - - £219,058

* Licences to Appraisers, Pawnbrokers, Dealers in Plate, Sellers of Patent Medicines and of Playing Cards, Hawkers and Pedlars, and House Agents were transferred from the Stamp to the Excise Revenue (27 & 28 Vict. cap. 56.)

Several alterations were made last year in Stamp Duties, but few of them can be said to have affected the Revenue to any appreciable extent. The most important in that respect was the reduction of the Fire Insurance Duty on stock-in-trade from 3*s.* to 1*s.* 6*d.* per hundred pounds insured, and it would have been incumbent on us to afford the fullest information as to the effect of that measure had it not been virtually superseded by the further measure of this Session, fixing the duty on all insurances at the same rate of 1*s.* 6*d.*

Reduction of Fire Insurance Duty on stock-in-trade.

The subject has now lost much of its interest, and it is unnecessary to notice the various difficulties which occurred in arriving at a satisfactory definition of stock-in-trade, or to enter minutely into the inquiry whether the experiment of reduction was successful as a stimulus to the practice of insurance.

That which it is most important to record for the statistics of taxation, is the amount of duty sacrificed by the alteration of rate; and this is a point upon which we are able to speak with more certainty than upon the other questions.

If the former rates had been continued, we assume that the net receipt for the year 1864–5 would have been 1,683,000*l.*, the annual increase of 50,000*l.* having been so regular that we can scarcely be wrong in concluding that the duty for 1864 would have been larger by that sum than the duty received in 1863.

The difference (111,000*l.*) between that estimate and the actual receipt, which was 1,572,000*l.*, represents the loss to the Revenue *within the financial year*. It does not represent the whole loss *on the insurances of that year*, because the duty on the accounts of the quarter ending on the 25th of March is not paid until the 25th of June.

Loss of Revenue within the financial year.

The amount of duty received in that last quarter was 416,000*l.*, and if we compare it with the receipt of the corresponding period of last year (which was not affected by the reduction) we find it less by 52,000*l.*, and therefore we must add rather more than that sum to 111,000*l.* in order to arrive at the loss of revenue on the transactions within the year 1864–5, which accordingly may be stated at 165,000*l.*

Amount of relief to the tax-payer.

But if we wish to ascertain the amount of stock-in-trade which is annually the subject of insurance, we must have recourse to some further analysis of the accounts.

Annual value of stock-in-trade insured against fire.

The amount of duty at 1*s.* 6*d.* received in the financial year was 156,057*l.*, but as the reduction was made to commence from the 24th of June, this is by no means a year's receipt of duty at that rate. Indeed, it does not fully represent the receipt of three quarters of a year, as it was in the two last quarters only, viz. from the 29th September 1864 to the 25th March 1865, that the reduced duty had its complete effect. But the receipt in the present year of the duty for another quarter gives us 206,121*l.* as the amount for three quarters, so that we may safely infer that the produce of the 1*s.* 6*d.* duty for 12 months would be as nearly as possible 275,000*l.* The value of insured property represented by this duty is 384,000,000*l.*, and the proportion which that bears to the value of the whole property insured against fire is nearly 32 per cent.

It seems, therefore, that the estimate which we obtained from some of the principal insurance offices was a very fair one, their calculation being that stock-in-trade was about one-third of the property insured. It is probable, indeed, that, but for the exclusion of certain descriptions of stock-in-trade by the limited terms of the definition in the Act, the value of insured property on which the lower rate of duty was paid would have been rather more than one-third of the whole.

We subjoin the figures from which we have drawn the inferences stated above:—

Periods at which the Amounts are made up.	Date of Payment of Duty.	Net Receipt at 1*s.* 6*d.* per 100*l.*
		£
25th June 1864 - -	26th September 1864 -	22,936
29th September 1864 -	23rd December 1864 -	62,966
24th December 1864 -	24th March 1865 -	70,155
25th March 1865 - -	25th June 1865 -	73,000

Marine Insurance.

The state of the law respecting re-insurance of sea risks, as it existed up to the year 1864, is thus described in Mr. Arnold's book on Marine Insurance:—

"After an insurance has been made, the underwriter "may, by the law and practice of every country except "our own, have either the whole amount at risk (or as

" in France, the whole, minus the premium) re-insured " to him by some other underwriter.

"The object of this is to enable him to indemnify " himself against the consequences of his own act, when- " ever he finds that he has undertaken a risk on im- " prudent terms, or bound himself to a greater amount " than he may be able to discharge.

" It appears that about the middle of last century this " practice of re-insurance, though perfectly reasonable " when confined to its proper object, had in this country " come to be employed as a mode of speculating in the " rise and fall of premiums; and the legislature, fore- " seeing that it might be used as a cover for wager " policies, declared in the 4th section of the 19 Geo. 2. " cap. 37, that it shall not be lawful to make re-insurance " unless the insurer shall be insolvent, become bankrupt, " or die; in either of which cases such insurer, his " executors, administrators, or assigns, may make re- " insurance to the amount of the sum before by him " insured, provided it be expressed in the policy to be a " re-insurance."

It is surprising that such a prohibition should have remained in force nearly up to the present time, for when it was brought under the notice of the Government early in the year 1864 by the underwriters in Liverpool it appeared that there was absolutely no ground on which the continuance of it could be supported; on the other hand, there were the strongest reasons for legalizing a course of proceeding which had become so necessary to the underwriters of sea risks that, notwithstanding its illegality, they were constantly obliged to have recourse to it. They stated in their application to your Lordships that " owing to the enormous increase in the extent and value " of mercantile operations, combined with the size and " costliness of modern vessels, the risks in one bottom " (as it is termed in insurance language) are greatly " increased, and owing also to the rapidity of communi- " cation between foreign ports and this country by means " of the telegraph, advices of losses frequently follow very " quickly after, and in some cases even precede, the " ordinary postal advices of shipment. It has thus " become absolutely necessary that merchants should " cover all expected shipments by open policies, on " which they may declare interest when they have re- " ceived advices. To take an instance from Bombay, " owing to the enhanced price of cotton, and the large " exports from India, merchants will require to effect

" open policies by ship or ships to the extent occasionally " of 100,000*l.* or upwards.

" There is frequently not time to offer this to various " underwriters, and the merchant therefore applies to " some large company to take the entire risk, and this " they do, and immediately divide it with other offices by " re-insurance policies, so that there shall be a reasonable " limit to the amount of their loss by any one ship.

" All this is quite legitimate and proper trading. These " re-insurances being illegal, and consequently only binding " on honour, are taken on unstamped paper, and although, " to the credit of the underwriters be it said, no question " as to them has ever been raised, yet the underwriters " would deem it a great boon if they were legalized and " placed on the same footing as other re-insurances."

27 & 28 Vict. cap. 56.

In consequence of these and similar representations, the prohibition of re-insurance was repealed, and it was enacted that the stamp duty on policies of re-insurance shall be repaid on satisfactory proof that the re-insurance has been made on the same property which has been previously insured to the same or a greater amount.

We propose briefly to notice the remaining alterations in Stamp Duties nearly in the order in which they occur in the Statute Book.

Duties on Settlements.

Several amendments were required in the law imposing ad valorem duties on Settlements. The first of them rectifies an omission which, though of small importance when the duty was originally imposed, has now become of some moment.

27 Vict. cap. 18, sec. 11.

The terms of the Act of the 55 Geo. 3. (which have been continued with slight variation to the present day) were held not to include in the subjects on which the duty is chargeable sums of money in foreign currencies, and shares in the stocks or funds of foreign and colonial governments or companies. It is now enacted that the duty shall be deemed to extend to such sums of money and shares.

27 Vict. cap. 18, sec. 12.

The next section in the Act is no less reasonable. The Court of Exchequer had decided, many years ago, that money secured by a Policy of Insurance was not chargeable with the ad valorem settlement Duty, not being, in the opinion of the Court, " a definite and certain sum of money." This decision was considered so questionable by the law officers of the day that they advised us to continue to charge the duty in such cases, in order to

bring the subject again under judicial review, but as no one ventured to accept the challenge thus thrown out, the law has remained in a doubtful state, until the necessity of placing it on a more satisfactory footing was suggested by the introduction of other amendments in the same branch of the law.

The two sections which we have been explaining impose additional charges. The next is in relief of the taxpayer, and was more particularly required after the extension of the duty to foreign stocks and funds, the real value of which often bears a very small proportion to the nominal value. The section enacts that the marketable value, whenever it can be ascertained with certainty, shall be the subject of taxation. 27 Vict. cap. 18, sec. 13.

The same Act contains new regulations respecting the duty on Powers of Attorney, and, in accordance with the usual and convenient practice of modern legislation, the Schedule to the Act gives, together with the new matter, a re-enactment of such parts of the old law as remain unchanged. Of that which is new, the first provision in order and importance relates to transactions in the Public Funds. A distinction, which did not previously exist, is now made between powers of attorney to sell or transfer public stocks and powers to receive dividends. The rate of duty was formerly the same in both cases. It is now continued, as before, in the case of sale or transfer, but is greatly reduced in the case of a power for receipt of dividends, and a further distinction is made between a power for the receipt of one payment and a power for a continuous receipt. It is, however, declared by a subsequent Act that a power of attorney at the higher rate shall cover the receipt of dividends as well as sale of stock. Powers of Attorney. 27 Vict. cap. 18, Sch. C. 27 & 28 Vict. c. 90.

These provisions have been extended to the public stocks or funds of the Government of India. 27 & 28 Vict. c. 56. s. 3.

There is then an imposition of a penny duty on Voting-papers used at meetings of companies, societies, etc.; a reduction of the duty on seamen's powers of attorney for receipt of wages (which are now on the same footing as powers for receipt of prize money), and finally a re-enactment of the original duty on all other powers of attorney, exactly in the terms of the old statute. 27 Vict. cap. 18, Sch. C.

We notice this re-enactment because it gave rise to a curious exhibition of conscientious regard for our stamp revenue on the part of certain railway, insurance, and other

joint stock companies, which led to a declaratory clause in a subsequent Act of the Session. Although, as we have said, no alteration whatever was made in the terms in which the duty on general powers of attorney was imposed, and although these companies had never imagined that those terms extended to the letters which it is usual for shareholders to write directing the payment of dividends to their bankers, they nevertheless took alarm at the re-enactment, and refused to act upon such directions unless impressed with a stamp of 30*s*. Our legal advisers did not agree with them in their view of the law, but it was found necessary to put an end to these inconvenient doubts by legislative authority.

Complaints of the operation of the law of Legacy Duties.

A letter in the "Times" newspaper in the Autumn of last year, complaining of the operation of the Legacy Duty Acts, elicited others of a similar kind, and produced an impression that either the law or the administration of it by this Department was unjust and oppressive. Complainants were invited to state their grievances to your Lordships, or to the Chancellor of the Exchequer, as the proper judges of appeal from our decisions, or those of the Controller of Legacy Duties, and consequently, in addition to some of those who had publicly, but anonymously, expressed their dissatisfaction, several others came forward to claim a hearing.

As we have received instructions from your Lordships to report generally on the operation of the Legacy and Succession Duties, we refrain at present from any discussion of the subject.

Probate Duty amended. 27 & 28 Vict. cap. 56, sec. 5.

Two slight alterations in the Probate Duty were made in the Session of 1864; the one being an exemption of all estates under the value of 100*l*. instead of 20*l*., the former limit; and the other being the imposition of the duty on the value of ships at sea, which not being within the jurisdiction of the Ordinary, had obtained exemption, however improperly and unreasonably, up to last year.

Bills of Exchange. 27 & 28 Vict. cap. 56, sec. 2.

The only further alteration of Stamp Duties which we have to notice is that on Bills of Exchange payable on demand endorsed out of the United Kingdom. By being drawn in the United Kingdom they were liable to the duty of 1*d*. only, and no further duty attached to them, although by being sent abroad and endorsed there they served all the purposes of foreign bills, which are liable to heavy ad valorem duties. They are now liable to the

same duties ad valorem as ordinary bills of exchange payable otherwise than on demand.

Increasing number of executed deeds brought to be stamped.

Much of our time is occupied in adjudicating penalties on unstamped instruments. Of ordinary deeds thus brought to our chief office for completion there seems to be a gradual increase. This no doubt arises in great measure from the general increase in the number of deeds, consequent upon the growth of railroads, the rise in value of landed property, and the prosperous condition of the country, but it may also be attributed to a practice which is extending itself among country solicitors, of having their deeds engrossed by law-stationers in London, who are careless or uninstructed as to the stamp.

It would be well if solicitors would bear in mind that every deed, in strictness of law, ought to be stamped not only before execution but before its engrossment; and if they paid proper attention to this requirement they would avoid the penalties which they now so frequently incur.

Unstamped receipts.

The giving unstamped receipts, and the refusal to give stamped acknowledgments upon satisfied accounts, occasionally become the subject of legal proceedings by our law officers, and since the Stamp Duty on receipts has been fixed at its present low rate, there is really no excuse for disregard of the law. Few persons can now allege ignorance of it.

Unstamped agreements.

In the case of agreements there is great neglect of the stamp law. So long as the duty remained at 2*s*. 6*d*. it was almost hopeless to expect any great improvement on the part of the public in having these documents stamped, but the present small amount of the stamp deprives such neglect of all excuse.

Applications for shares in new Companies should be stamped as agreements.

We desire particularly to call attention to a class of agreements which are very seldom properly stamped. We allude to the applications for shares in newly created companies, the form almost universally adopted being such as to bring the documents under the denomination of agreements, when signed by the applicants. The directors or managers and secretaries of these companies would do well to attend to this, and to remember that the right of the companies to sue or proceed against the allottees of shares is invalid so long as the agreements on which they would found their claim in a court of law remain unstamped.

SUMMARY of the Alterations made in Stamp Duties in the Year 1864.

——	Former Duties.	Duties for 1864–5.	Act.
Fire Insurance -	3*s.* per cent. on all insurances.	On insurances of stock in trade 1*s.* 6*d.* per cent. On other insurances 3*s.* per cent.	27 Vict. c. 18.
Re-insurance of Sea Risks.	- - -	The same as on original policies. The duty to be repaid on proof that the property has been previously insured to the same or a greater amount.	27 & 28 Vict. c. 56.
Settlements of money in foreign currencies, and shares in the stocks or funds of foreign and Colonial Governments or Companies.	- - -	The same ad valorem duty as on other settlements. The value for the purposes of the Stamp laws to be the marketable value.	27 Vict. c. 18.
Settlements of money secured by Policies of Insurance.	- - -	The same as on other settlements.	Do.
Proxies - -	6*d.*	1*d.*	Do.
Powers of Attorney for receipt of dividends in the Public Funds, one payment only - -	1*l.*	1*s.*	Do.
Do. do. more than one payment	1*l.*	5*s.*	Do.
Do. do. for receipt of seamen's wages	1*l.*	1*s.*	Do.
Bills of Exchange payable on demand and endorsed abroad.	1*d.*	Ad valorem, the same as on bills of exchange payable otherwise than on demand.	27 & 28 Vict. c. 56.

SUMMARY of the Alterations made in Stamp Duties in the Year 1864—*continued.*

——	Former Duties.	Duties for 1864.	Act.
Collation or appointment to Honorary Canonries and other Cathedral dignities without emolument - -	2*l.*	Exempt - -	27 Vict. c. 18.
Admissions to benefices of the annual value of 300*l.* and under.	Under 300*l.* 7*l.*, amounting to 300*l.* and under 400*l.*, 12*l.*	Exceeding 50*l.* and not exceeding 100*l.*, 1*l.*, exceeding 100*l.* and not exceeding 150*l.*, 2*l.*, „ 150*l.* „ 200*l.* 3*l.* „ 200*l.* „ 250*l.* 4*l.* „ 250*l.* „ 300*l.* 5*l.*	Do.
Probates, where the effects do not exceed 100*l.*	Under 100*l.* 10*s.*, 100*l.* 2*l.*	Exempt - -	27 & 28 Vict. c. 56.

LAND AND ASSESSED TAXES.

NET RECEIPT in the Years ended 31st March 1864 and 1865.

	Year ended 31st March 1864.	Year ended 31st March 1865.	Increase.	Decrease.
	£	£	£	£
Land Tax - -	1,107,754	1,123,920	16,166	—
Inhabited Houses -	898,274	916,806	18,532	—
Servants - -	208,831	211,244	2,413	—
Carriages - -	350,833	358,801	7,968	—
Horses - -	382,842	389,357	6,515	—
Dogs - - -	205,329	210,330	5,001	—
Horse Dealers -	14,957	14,949	—	8
Hair Powder -	1,052	1,028	—	24
Armorial Bearings -	60,182	61,499	1,317	—
Total £	3,230,054	3,287,934	57,912	32
		Deduct Decrease -	32	
		Net Increase -	57,880	

PROPERTY AND INCOME TAX.

NET RECEIPT in the Years ended 31st March. 1864 and 1865.

	Years ended 31st March.		Increase.	Decrease.
	1864.	1865.		
	£	£	£	£
Schedule A.	4,243,700	3,709,485	—	534,215
„ B.	489,954	425,824	—	64,130
„ C.	935,274	735,552	—	199,722
„ D.	2,838,441	2,608,729	—	229,712
„ E.	594,625	506,183	—	88,442
Net Receipt £	9,101,994	7,985,773	—	1,116,221

Improvement in the property assessed in 1864–5.

The tax was reduced from 7*d.* to 6*d.* in the pound from the 1st April 1864. The estimate of the produce of the tax at this rate within the financial year was 7,800,000*l.* This was based on the very liberal calcu-

lation of a yield equivalent to 1,230,000*l.* for each penny of tax, much more than was warranted by the actual receipts in former years, but about what might fairly be anticipated from the new assessments under Schedules A. and B. and the general progress of the country. It appears, therefore, from the excess of 180,000*l.* over this sanguine estimate, that the improvement upon the assessments of former years is very remarkable.

No detail can be given at present.

We have previously explained on more than one occasion in our Annual Reports that under the present system we have not the means of examining the assessments until long after the year for which they are made, and that consequently we can give but little information respecting the operation of the tax in the year which we have under review. Your Lordships will also bear in mind that the mere account of the produce of the tax does not represent the assessments of the year, because it is composed of nearly one-third of the tax from the previous year's assessment, and two-thirds of the tax of the year in question. When there has been an alteration in the rate of the tax, it is of course still more difficult to arrive at any conclusion, from the accounts of receipt within the year, as to the effect of the alteration.

We are unable, therefore, to give any detailed information respecting the new assessments under Schedules A. and B. which were made in 1864, but we know that in many districts the amount of duty both under Schedule A. and Schedule D. is greater than it was when the tax was at 7*d.* in the pound, and we are happy to say that this remarkable improvement has shown itself in Ireland as well as in Great Britain.

So far as Schedules A. and B. are concerned this result is attributable in no small degree to the care and judgment with which the assessments were made on this occasion by our Surveyors, acting under special instructions from this office. We have also been much assisted by the valuations under the Union Assessment Act, especially in the case of land in the occupation of the owner, where the former unsatisfactory parochial rating to the relief of the poor was the guide on which our officers chiefly relied.

The same Act has likewise furnished a much higher valuation on a description of property most difficult to assess fairly—the houses of country gentlemen.

Our Surveyors deserve as much credit for the discretion with which they have acted in making these assessments as for their zeal for the interests of the Revenue. No similar assessments have been made in former years with so few complaints on the part of the public, or with so few appeals to the District Commissioners.

In order to avoid all unnecessary trouble both to tax-payers and Commissioners, we directed our officers to go through the assessments with the assessors, and to agree upon a list of cases in which the Commissioners might properly be recommended to give relief by amendment of the assessment, and without requiring the parties to attend at the meeting for hearing appeals. This arrangement has had a most satisfactory effect.

Frauds.

In the course of our remarks upon the subject of the Income Tax we have generally given instances of the enormous frauds which are perpetrated by the class of persons taxable under Schedule D.; but it seems useless to encumber our Report with statements which are so nearly the same in each year, and which are not likely to produce any effect without the names of the parties.

In the United States there is a very curious publication called "The Income Record—A list giving the taxable "income of every resident in New York," the author of which says, in the preface: "As to frauds on the "Revenue, there are no reliable statistics. In England "it is estimated by an able writer on taxation that the "Government is defrauded of fully one-third of the "Taxes due to it. We do not think that in this country "it will amount to more than one-tenth, and much "of that results from ignorance, rather than a desire "to defraud."

The writer does not inform us how he arrives at a conclusion so favourable to his countrymen, nor have we the means of knowing whether the result is produced by their superior integrity, or by a better system of assessment than that of this country. But undoubtedly such a publication as that from which we have quoted must go far towards enforcing honesty in the taxpayers.

The objects of the work are stated to be—"First, "to satisfy an imperious public curiosity, which has "thus far been only partially gratified by the public "journals. Secondly, to supply the means whereby

" our citizens can ascertain, so far as official records " permit, whether their neighbours perform their duty " in bearing their share of the public burdens; and " lastly, to furnish statistics."

We cannot venture to recommend a similar publication in England, though we have no doubt that it would have a most beneficial influence in the Returns under Schedule D. So scrupulous, however, is the care with which our Legislature has guarded against the disclosure of any particulars with which the officers of this Department become acquainted in levying the tax, that we are not allowed to divulge the names even of those whom we detect in the grossest frauds. Year after year we have given a selection from the cases which have come under our notice, but we have been obliged carefully to avoid furnishing any clue to the individuals concerned, so that the announcement amounts to little more than a statement that numerous instances have occurred of false returns, by which the Revenue would have been largely defrauded had they not been detected. We may add, with a thorough conviction that we are correct, that the cases are very much more numerous in which the parties escape detection altogether.

Conscience-money.

The payment of conscience-money occasionally gives us startling evidence of our inability to obtain a correct knowledge of the incomes on which we should levy the tax. Even while we write this Report, the sum of 10,000 guineas has been paid to the account of Revenue as conscience-money for unpaid Income Tax by an individual, and we have, in a former year, received also from one person upwards of 11,000*l.* on the same account.

Assessments of 1863–4.

We now turn to the assessments for the year 1863–4, the latest which we have received.

Allowance of 60*l.* in incomes under 200*l.*

The operation of the allowance of 60*l.* to persons having incomes between 100*l.* and 200*l.* a year, has been to relieve from tax in the year 1863–4 income amounting in the whole to about 10,000,000*l.*, or about 3 per cent. of the total amount of the property and profits charged to tax in that year of assessment.

The assessments for the year 1863–4 under Schedule A. in Great Britain exhibit an increase over those for the year 1862 to the extent of 1,860,000*l.*; thus:—

	£
England - - -	1,662,000
Scotland - - -	198,000

This increase is for the most part to be attributed to improvements in the assessments under the following heads, viz. :—

	£
Houses	1,197,000
Railways	330,000
Iron Works	108,000
Mines	56,000
Gas Works	44,000

The assessments in Ireland under Schedule A. for 1863 show a net decrease of 23,000*l.* as compared with those for 1862, arising from a falling off in the produce from mines and railways.

The increase in the gross assessments under Schedule D. for the year 1863 over those for 1862 amounts to 9,209,000*l.*, thus :—

	£
England	8,263,000
Scotland	844,000
Ireland	102,000

The under-mentioned districts yield the principal portion of this great improvement in the profits of trades and professions.

Metropolitan Districts.

	£
City of London	3,123,000
Westminster	552,000
Bloomsbury	134,000
Mile End and Tower	175,000
Holborn and St. Pancras	172,000
Kensington	100,000
Finsbury	87,000
Southwark	90,000
Brixton	87,000

Provincial Districts.

	£
Liverpool	997,000
Manchester	295,000
Bradford	199,000

	£
Leeds	154,000
Sunderland	109,000
Sheffield	102,000
Stoke-upon-Trent	75,000
Leicester	61,000
Newcastle-on-Tyne	54,000
Kidderminster	49,000
Hull	47,000
Walsall	45,000
Gateshead	43,000
Greenwich	43,000
Wolverhampton	40,000

The only decrease of any importance to be found under Schedule D. is in the Bury District, where the assessments amount to 127,000*l.* less than those in 1862. This decrease is attributable to the failure in the cotton supply.

Praiseworthy exertions of Surveyors of Taxes.

We have mentioned with commendation the services rendered by the Surveyors of Taxes in making the new assessments under Schedules A. and B., and we feel it due to those officers to add that, as a body, they have been conspicuous for their exertions during the past year in the business both of Assessed Taxes and Income Tax. But it cannot be doubted that recent improvements which we have made in the Department have largely contributed to the efficiency which we have noticed. We allude more particularly to the sub-division of districts, and to the careful inspections of the Chief Inspector and his assistant.

Sub-division of districts.

In almost every case in which a district has been divided there has been an immediate increase of revenue to a much greater extent comparatively than in other districts, so that the additional expense in salaries has been far more than repaid.

New scheme of inspection.

The plan of inspection of the country districts inaugurated by the head of the department will be carried out in future on an extended scale, under his directions, by the Inspectors who have been removed, with your Lordship's sanction, from their districts in the country to this office, where they form a department analogous to that of the Surveying General Examiners of

Excise, from which such great benefits have been derived. We anticipate much good from this alteration in the establishment.

Abolition of Chief Examiner.

Your Lordships were pleased to concur in another suggestion made by us respecting the Chief Inspector's Department,—by placing under his control the clerks belonging to the Chief Examiner, whose office was abolished. The saving of that officer's salary, amounting to 650*l.*, is probably the least important result of the measure, because it has enabled us to dispense with many accounts and documents involving labour which may now be more usefully applied.

Inspection by members of the Board.

After the acknowledgment which we have made of the services of the able officers above referred to, we may be permitted to say that the visits of those members of the Board who have most frequently inspected the Surveyors' districts have originated many of the most useful improvements, and have greatly conduced to the maintenance of a proper spirit and discipline in the Department.

Stamp distribution united with Excise collection.

In the Stamp Department we have continued to recommend, wherever an opportunity occurred, the union in one person of the two offices of Distributor of Stamps and Collector of Excise. The only case, however, which presented itself in the past year was that of the distribution at Dumfries, where the financial result is a saving of about 400*l.* a year.

Excise. Additional allowances to Examiners.

In the Excise Department there has been very little alteration. Your Lordships granted an addition of 20*l.* a year to the allowance of Examiners when acting for Supervisors, which, while satisfying the reasonable demands of those officers, has imposed only the comparatively trifling annual charge of 500*l.*

General efficiency of the Excise department.

We must not allow it to be supposed, if we dismiss the subject of the Excise Establishment with comparatively brief notice, that we have not reason to be satisfied with its efficiency; for the fact is, that the organization of the Excise is so admirably contrived for the collection of revenue that it is the model on which we endeavour to form the rest of our establishment, and the improvements to which we refer in the Tax Department are approximations to that system, which has prevailed from a remote period in the Excise. Of course in the details there have been alterations from time to time to meet the altered circumstances of the times, but most of the general

principles of the system appear to have been established very early in the history of that branch of the Revenue.

If, then, we do not speak of improvements, it is because the Excise Department has less need of them than any other.

We have the honour to be
Your Lordships most obedient humble servants,

W. H. Stephenson.
C. J. Herries.
Alfred Montgomery.
Henry Roberts.
Alex. Duff Gordon.
James Disraeli.

Inland Revenue Office,
July 1865.

APPENDIX.

An Account of the Gross Receipt of the Duties of Excise in the Years 1855, 1856, 1857, 1858, 1859, 1860, 1861, 1862, 1863, and 1864.

	1855. Ended Mar. 31, 1856.	1856. Ended Mar. 31, 1857.	1857. Ended Mar. 31, 1858.	1858. Ended Mar. 31, 1859.	1859. Ended Mar. 31, 1860.	1860. Ended Mar. 31, 1861.	1861. Ended Mar. 31, 1862.	1862. Ended Mar. 31, 1863.	1863. Ended Mar. 31, 1864.	1864. Ended Mar. 31, 1865.
ENGLAND.	£	£	£	£	£	£	£	£	£	£
Chicory	—	—	—	—	—	357	2,317	3,010	7,211	10,463
Game Licences	—	—	—	—	—	106,324	117,685	106,826	113,809	*—
Hackney Carriages	69,663	74,429	80,153	82,129	86,203	87,812	91,375	97,692	98,290	102,767
Licences	1,152,427	1,158,178	1,172,860	1,183,631	1,206,908	1,233,140	1,239,138	1,490,888	1,564,359	1,827,236
Malt	6,293,516	6,286,554	5,091,595	5,126,968	6,269,326	5,835,069	5,459,749	5,075,495	5,737,001	5,979,591
Race Horses	—	—	5,224	5,771	6,233	6,245	6,957	6,422	7,288	7,746
Railways	298,591	306,345	320,091	310,854	329,744	337,079	342,145	353,159	371,441	405,369
Stage Carriages	123,299	106,272	109,645	115,579	118,102	118,470	116,313	123,513	119,426	119,999
Spirits, Home-made	3,437,889	3,706,632	4,014,411	4,073,452	4,340,197	4,462,804	4,444,610	4,436,666	4,424,561	4,600,743
Sugar used in Brewing	3,059	943	—	—	—	47	—	—	—	4,198
Sugar, Home-made	—	—	—	—	—	—	—	89	—	39
	11,378,444	11,639,353	10,793,979	10,898,384	12,356,713	12,187,347	11,820,289	11,693,760	12,443,386	13,058,151
Hops	93,599	725,769	489,008	416,478	462,881	588,658	223,296	3,099	—	—
Paper	831,553	929,432	920,934	945,036	1,077,726	1,091,739	587,147	—	—	—
TOTAL	12,303,596	13,294,554	12,203,921	12,259,898	13,897,320	13,867,744	12,630,732	11,696,859	12,443,386	13,058,151
SCOTLAND.										
Game Licences	—	—	—	—	—	12,553	13,147	11,983	12,243	*—
Licences	131,285	129,555	127,805	127,220	129,683	131,771	132,882	143,976	149,970	173,690
Malt	401,211	183,457	167,542	189,986	240,234	222,145	232,661	227,123	262,043	274,401
Railways	25,199	27,718	28,520	28,715	29,468	29,209	30,032	29,898	32,184	33,975
Stage Carriages	9,818	8,535	8,943	9,437	9,571	9,499	9,244	9,085	9,163	9,237
Spirits, Home-made	2,539,117	2,911,796	2,807,969	2,750,394	2,972,642	2,754,289	3,056,516	3,147,136	3,359,131	3,570,654
Sugar used in Brewing	249	116	—	—	—	—	—	—	—	239
	3,106,879	3,261,177	3,140,779	3,105,752	3,381,598	3,159,466	3,474,482	3,596,201	3,825,634	4,062,196
Paper	243,392	263,391	271,662	284,600	317,592	310,960	182,780	—	—	—
TOTAL	3,350,271	3,524,568	3,412,441	3,390,352	3,699,190	3,470,426	3,657,262	3,569,201	3,825,634	4,062,196
IRELAND.										
Game Certificates	10,348	11,069	11,500	12,228	13,047	11,029	10,152	9,636	9,410	*—
Licences	117,379	121,719	124,447	126,041	127,934	129,020	129,885	144,824	147,866	158,973
Malt	281,421	240,226	232,869	275,670	342,808	325,758	337,378	278,063	307,031	343,650
Spirits, Home-made	2,221,010	2,514,173	2,458,583	2,364,996	2,687,352	2,269,618	2,464,250	2,292,479	2,349,663	2,468,650
Sugar, ditto	—	548	—	—	—	—	—	—	—	—
Sugar used in Brewing	226	283	—	—	—	5	—	—	—	107
	2,630,384	2,888,018	2,827,399	2,778,935	3,171,281	2,735,430	2,941,665	2,725,002	2,813,970	2,971,400
Paper	48,617	51,320	52,127	51,387	55,936	60,389	29,991	—	—	—
TOTAL										

Chicory	—	—	—	—	—	357	2,317	3,010	7,211	10,463
Game Certificates and Licences	10,348	11,069	11,500	12,228	13,047	129,906	140,984	128,445	135,462	*—
Hackney Carriages	69,663	74,429	80,153	82,129	86,203	87,812	91,375	97,692	98,290	102,767
Licences	1,401,091	1,409,452	1,425,112	1,436,892	1,464,575	1,493,931	1,501,904	1,779,688	1,862,194	2,159,900
Malt	6,976,148	6,710,237	5,492,006	5,592,624	6,852,458	6,382,972	6,029,788	5,580,681	6,306,975	6,597,641
Race Horses	-	-	5,224	5,771	6,233	6,245	6,957	6,422	7,288	7,746
Railways	323,790	334,063	348,611	339,569	359,212	366,288	372,178	383,057	403,626	439,344
Stage Carriages	133,117	114,807	118,588	125,016	127,673	127,969	125,557	132,598	128,589	129,237
Spirits, Home made	8,198,016	9,132,601	9,280,963	9,188,842	10,000,191	9,486,711	9,965,376	9,876,281	10,133,355	10,640,067
Sugar, ditto	-	548	—	—	—	—	—	89	—	39
Sugar used in Brewing	3,534	1,342	—	—	—	52	—	—	—	4,544
	17,115,707	17,788,548	16,762,157	16,783,071	18,909,592	18,082,242	18,236,436	17,987,963	19,082,990	20,091,743
Hops	93,599	725,769	489,008	416,478	462,881	588,658	223,296	3,099	—	—
Paper	1,123,562	1,244,143	1,244,723	1,281,023	1,451,254	1,463,[illegible]8	799,918	—	—	—
TOTAL	18,332,868	19,758,460	18,495,888	18,480,572	20,823,727	20,133,989	19,259,650	17,991,062	19,082,990	20,091,748

ALTERATIONS IN THE RATES OF DUTIES, &c.

1855:—Spirits—Scotland—increased 1*s.* 10*d.* per gallon, from April 20, 1855; and further increased 2*d.* per gallon, from October 1, 1855.
Spirits—Ireland—increased 2*s.* per gallon, from April 20, 1855; and further increased 2*d.* per gallon, from October 1, 1855.
Spirits—England—increased 2*d.* per gallon, from October 1, 1855.
Stage Carriage Duty, reduced from 1½*d.* to 1*d.* per mile, from July 1, 1855.
Stage Carriage Duty, Supplementary Licences reduced from 5*s.* to 1*s.* each, from July 1, 1855.
Sugar, Home made, Duties increased various rates, from April 20, 1855.
Sugar used in Brewing, reduced from 6*s.* 6*d.* to 3*s.* 9*d.* per cwt. from April 20, 1855.
Licence Duty of 10*l.* 10*s.* to Makers of Methylated Spirits imposed, from October 1, 1855.

1856:—Malt War Duty, repealed from July 5, 1856, viz.:—from Barley, 1*s.* 3½*d.* per bushel; from Bere or Bigg, 1*s.* 1*d.* per bushel.
Sugar used in Brewing, 3*s.* 9*d.* per cwt., ceased July 5, 1856; to revive, April 5, 1858.

1857:—Race-Horse Duty transferred from Assessed Taxes, from April 5, 1857.

1858:—Spirits—Ireland—duty increased 1*s.* 10*d.* per gallon, from April 19, 1858.
Sugar used in Brewing, the revival of this Duty deferred until the 1st April, 1860, per Act 21st Vict. c. 15.

1859:—Spirits—United Kingdom—duty increased 1*d.* per gallon from February 29, 1860.

1860:—Licences—England and Ireland—to keep Refreshment Houses, and to Retail Foreign Wine, at various rates, imposed from July 1, 1860.
Spirits—United Kingdom—Duty increased 1*s.* 11*d.* per gallon, from July 17, 1860.
Game Licences—Great Britain—Transferred from Assessed Taxes to Excise, August 13, 1860, and rates of duty altered.
Chicory—United Kingdom—Duty of 3*s.* per cwt. imposed from August 28, 1860.
Licences—United Kingdom—To Dealers in Sweets or made Wines, 5*l.* 5*s.* imposed from August 28, 1860.
Hops—Great Britain—Duty reduced from 2*d.* and 5 per cent. to 1½*d.* per lb., from August 28, 1860.
The revival of the duty on Sugar used in brewing further deferred until April 1, 1861.

ALTERATIONS IN THE RATES OF DUTIES, &c.—*continued.*

1861:—Paper duty repealed from September 30, 1861.
Chicory Duty increased on April 1, 1861, 2*s.* 6*d.* per cwt., and on June 12, 3*s.* per cwt.
Licences to Dealers in Spirits to sell Spirits in quantities not less than one reputed quart bottle, 3*l.* 3*s.*
Licences to Sellers of Table Beer at a price not exceeding 1½*d.* per quart, 5*s.*, imposed June 28, 1861.
Licences to Retailers of Methylated Spirits, 2*l.* 2*s.*, imposed August 6, 1861.
The revival of the Duty on Sugar used in Brewing, further deferred until July 1, 1862.

1862:—Hop Duty repealed from June 3, 1862.
Chicory Duty increased on April 1, 1862, from 8*s.* 6*d.* to 11*s.* per cwt.
Brewers' Licences increased from October 10, 1862, and mode of rating altered.
Victuallers' Occasional Licences imposed, 5*s.*, June 3, 1862.
The revival of the Duty on Sugar used in Brewing further deferred until July 1, 1863.

1863:—Chicory Duty increased from 11*s.* to 1*l.* 1*s.* 9*d.* per cwt, from June 8, 1863.
Beer Dealers additional Licence to retail at 1*l.* 1*s.*, from June 29, 1863.
Publicans whose houses are rated under 20*l.*, and who do not sell Spirits, Licence to retail Beer increased from 1*l.* 2*s.* 6½*d.* to 3*l.* 6*s.* 1½*d.*, from Oct. 10, 1863.
Stage Carriages used occasionally only—Daily Licences granted at various rates, and the Licence and Duty on Stage Carriages to convey not more than eight persons, reduced from 3*l.* and 1*d.* per mile respectively to 10*s.* and ½*d.* per mile, from June 29, 1863.
Victuallers' Occasional Licences—Rates altered to 2*s.* 6*d.* per day, and 10*s.* for any number of days not less than four nor exceeding six after the first six days, from June 29, 1863.
The revival of the Duty on Sugar used in brewing further deferred.

1864:—Chicory Duty increased from 1*l.* 1*s.* 9*d.* to 1*l.* 4*s.* 3*d.* per cwt. from April 1, 1864.
Sugar, Home made, Duty reduced various rates, from April 16, 1864.
Sugar used in Brewing, Duty increased to 3*s.* 4*d.* per cwt., from April 16, 1864.
Licences to sell Tea, &c., Duty reduced to 2*s.* 6*d.* where house is rated to the Relief of the Poor at less than 8*l.*
Occasional Licences to sell Wine, Beer, and Tobacco, not exceeding three days. Wine or Beer, 1*s.* per day. Tobacco, 4*d.* per day.
Licences to Hawkers, Dealers in Plate, Appraisers, House Agents, Pawnbrokers, Sellers of Playing Cards and of Patent Medicines, transferred from the Stamps to the Excise.

* Included with other Licences.

An Account of the Gross Receipt of the Duties of Stamps in the Years 1855, 1856, 1857, 1858, 1859, 1860, 1861, 1862, 1863, and 1864.

	1855. Ended Mar. 31, 1856.	1856. Ended Mar. 31, 1857.	1857. Ended Mar. 31, 1858.	1858. Ended Mar. 31, 1859.	1859. Ended Mar. 31, 1860.	1860. Ended Mar. 31, 1861.	1861. Ended Mar. 31, 1862.	1862. Ended Mar. 31, 1863.	1863. Ended Mar. 31, 1864.	1864. Ended Mar. 31, 1865.
ENGLAND.	£	£	£	£	£	£	£	£	£	£
Deeds and other Instruments	969,145	1,061,550	1,051,365	1,054,445	1,079,496	1,138,985	1,157,116	1,209,320	1,327,159	1,464,556
Probates of Wills and Letters of Administration	1,078,100	1,087,294	1,102,519	1,156,991	1,132,200	1,192,979	1,206,292	1,218,358	1,345,871	1,391,012
Bills of Exchange	366,356	432,942	437,842	390,003	429,272	490,195	464,994	483,401	568,266	663,983
Bankers' Notes and Composition for Bankers' Bills and Notes	35,099	35,090	35,687	33,635	33,889	31,894	30,899	91,720	92,550	93,221
Receipts and Drafts	231,715	247,296	247,575	376,648	343,442	377,366	363,622	391,122	414,284	433,881
Marine Insurances	301,523	299,282	293,552	266,798	305,074	309,558	321,045	351,250	391,052	381,472
Licences and Certificates	156,709	163,635	170,847	173,361	175,352	174,846	200,637	191,807	196,272	98,332
Newspapers and Supplements	208,148	122,242	117,541	109,269	105,182	99,923	94,499	92,469	88,945	88,124
Medicine	39,758	45,993	42,987	42,721	45,281	46,329	45,856	49,718	51,563	54,887
Legacies and Succession Tax	1,482,439	1,587,251	1,614,449	1,895,295	1,799,834	1,862,786	1,951,367	2,043,183	1,893,064	1,982,721
Fire Insurances	1,205,407	1,243,341	1,269,120	1,311,636	1,334,282	1,375,798	1,412,079	1,454,484	1,502,214	1,450,112
Gold and Silver Plate	70,596	74,176	71,625	63,812	70,456	75,361	62,818	64,778	66,803	70,388
Cards	12,328	14,575	13,634	15,046	15,256	14,533	13,637	9,269	8,238	8,778
Probate Court Fee Stamps	—	—	15,015	50,682	40,472	50,272	98,078	106,988	116,303	122,777
Divorce and Matrimonial Causes Fee Stamps	—	—	196	2,221	2,557	2,619	2,664	2,440	2,677	2,960
Admiralty Court Fee Stamps	8,357	5,376	5,303	6,096	6,578	9,025	9,616	9,862	9,267	9,808
Patents for Inventions	81,105	90,869	82,080	83,794	102,457	104,758	102,052	111,331	110,592	113,579
Land Registry Fee Stamps	—	—	—	—	—	—	—	64	133	411
TOTAL	6,246,785	6,510,912	6,571,337	7,032,453	7,030,080	7,357,227	7,537,271	7,881,564	8,185,253	8,431,002
SCOTLAND.										
Deeds and other Instruments	100,397	109,558	121,870	124,323	119,606	110,799	105,483	113,692	111,543	111,625
Probates of Wills and Letters of Administration	90,239	81,669	89,751	97,687	118,826	119,439	130,818	136,007	144,222	155,808
Bills of Exchange	55,108	61,890	63,078	52,776	57,965	61,170	58,889	58,904	65,606	74,139
Bankers' Notes and Composition for Bankers' Bills and Notes	6,482	10,828	10,728	11,434	13,718	15,588	16,265	16,782	17,326	17,258
Receipts and Drafts	29,464	31,084	31,877	36,716	38,578	43,503	44,277	46,947	48,005	51,156
Marine Insurances	21,978	25,506	25,173	19,577	19,379	18,251	17,145	18,713	19,512	21,168
Licences and Certificates	25,299	29,259	31,013	30,219	29,079	29,006	30,655	30,858	31,671	22,989
Newspapers and Supplements	25,877	19,411	18,958	19,367	19,100	18,112	17,662	16,485	16,536	15,574
Medicine	259	423	316	370	343	444	381	399	512	446
Legacies and Succession Tax	139,692	205,948	196,108	170,991	178,957	189,529	215,187	211,685	216,972	212,327
Fire Insurances	79,502	83,075	89,536	93,183	98,179	107,295	119,106	124,250	129,043	125,137
Gold and Silver Plate	2,369	2,713	2,794	2,540	2,451	2,269	1,858	1,745	1,979	2,042
TOTAL	576,666	661,364	621,202	659,188	696,181	721,405	757,726	776,467	802,927	809,669
IRELAND.										
Deeds and other Instruments	81,885	85,604	87,928	91,313	89,406	86,401	82,249	82,954	77,748	76,905
Probates of Wills and Letters of Administration	76,735	72,044	78,643	83,411	82,180	82,396	82,056	88,658	92,080	96,052
Bills of Exchange	27,179	30,306	31,400	32,406	34,092	38,658	40,611	41,304	39,954	41,212
Bankers' Notes and Composition for Bankers' Bills and Notes	22,293	24,189	24,333	22,704	25,213	24,731	22,716	20,683	20,193	20,681
Receipts and Drafts	20,668	23,869	23,172	30,210	29,415	35,685	31,546	32,654	33,564	34,252
Marine Insurances	891	901	794	696	1,255	926	863	684	677	559
Licences and Certificates	19,492	15,969	15,918	14,920	16,025	15,547	15,495	15,305	15,482	10,110
Newspapers	29,009	22,449	22,492	22,554	22,967	21,368	21,225	20,009	19,278	18,375
Legacies and Succession Tax	90,654	87,789	114,168	145,536	151,230	117,265	111,170	133,639	153,928	152,036
Fire Insurances	59,249	62,559	65,127	67,619	71,277	76,744	80,496	80,942	83,866	76,086
Gold and Silver Plate	1,069	1,370	1,271	1,369	1,245	1,249	843	831	676	774
Cards	—	—	—	—	—	—	—	—	77	148
Probate Court Fee Stamps	—	—	1,569	6,727	7,525	7,539	11,953	12,567	12,612	13,024
Registration of Deeds Fee Stamps	—	—	—	—	—	—	—	—	—	3,503

TOTAL - - -	467,590	462,952	502,966	535,701	566,488	547,382	545,890	577,015	592,377	580,229
UNITED KINGDOM.										
Deeds and other Instruments - - - - -	1,151,427	1,256,712	1,261,163	1,270,081	1,288,508	1,336,185	1,344,848	1,405,966	1,516,450	1,653,086
Probates of Wills and Letters of Administration - - -	1,245,074	1,241,007	1,270,913	1,338,089	1,333,206	1,394,814	1,419,166	1,443,023	1,582,173	1,642,872
Bills of Exchange - - - - - - -	448,643	525,138	532,320	475,185	521,329	590,023	564,494	583,609	673,826	779,334
Bankers' Notes and Composition for Bankers' Bills and Notes -	63,874	70,107	70,748	67,773	72,820	72,213	69,880	129,185	130,069	131,160
Receipts and Drafts - - - - - - -	281,847	302,249	302,624	443,574	411,435	462,554	439,445	470,723	495,853	519,289
Marine Insurances - - - - - - -	324,392	325,089	319,519	287,071	325,708	328,735	339,043	370,617	411,241	403,199
Licences and Certificates - - - - -	201,500	208,863	217,778	218,500	220,456	219,309	246,787	237,970	243,425	131,431
Newspapers and Supplements - - - - -	263,034	164,102	158,991	151,190	147,249	139,403	133,386	128,963	124,759	122,073
Medicine - - - - - - - -	40,017	46,416	43,303	43,091	45,624	46,773	46,237	50,117	52,075	55,333
Legacies and Succession Tax - - - - -	1,712,785	1,880,988	1,864,725	2,211,822	2,130,021	2,169,580	2,277,724	2,388,507	2,263,964	2,347,084
Fire Insurances - - - - - - -	1,344,158	1,388,975	1,423,783	1,472,443	1,503,738	1,559,837	1,611,681	1,659,676	1,715,123	1,651,335
Gold and Silver Plate - - - - - - -	74,034	78,259	75,690	67,721	74,152	78,879	65,519	67,354	69,458	73,204
Cards - - - - - - - - -	12,328	14,575	13,634	15,046	15,256	14,533	13,637	9,269	8,315	8,926
Probate Court Fee Stamps - - - - -	—	—	16,584	57,409	56,997	57,811	110,031	119,555	128,915	135,801
Divorce and Matrimonial Causes Fee Stamps - - - -	—	—	196	2,221	2,557	2,619	2,664	2,440	2,677	2,960
Admiralty Court Fee Stamps - - - -	8,357	5,376	5,303	6,096	6,578	9,025	9,616	9,862	9,267	9,808
Patents for Inventions - - - - - -	81,105	90,869	82,080	83,794	102,457	104,758	102,052	111,331	110,592	113,579
Land Registry Fee Stamps - - - - - -	—	—	—	—	—	—	—	64	133	411
Registration of Deeds Fee Stamps - - - - -	—	—	—	—	—	—	—	—	—	3,503
Law, Equity, Exchequer, and Chancery Fund - - -	38,775	35,883	35,688	36,236	34,658	38,873	44,177	46,785	42,242	36,512
TOTAL - - -	7,291,350	7,635,208	7,695,042	8,247,342	8,292,749	8,626,014	8,840,387	9,235,046	9,580,557	9,820,900

ALTERATIONS IN THE RATES OF DUTIES, &c.

1855:—Newspaper Stamps—Duty repealed, except for transmission by Post, from June 30, 1855.
Admiralty Court Fee Stamps, imposed August 7, 1854.

1857:—Probate Court Fee Stamps, and Divorce and Matrimonial Causes Fee Stamps, imposed from Jan. 11, 1858.

1858:—Draft or Order for Money drawn on a Banker (hitherto exempt) Stamp Duty of 1*d.* imposed from May 24, 1858.
Passport Stamps Duty reduced from 5*s.* to 6*d.* from June 14, 1858.

1859:—Probates of Wills and Letters of Administration—graduated stamp duty on, extended per Act 22 & 23 Vict. c. 36.

1860:—Dock Warrants—Duty of 3*d.* imposed from April 3, 1860.
Delivery Orders upon sale or transfer of Goods of the value of 40*s.* or upwards—Duty of 1*d.* imposed from April 3, 1860.
Certified Copy or Extracts from the Registers of Births, Baptisms, Marriages, Deaths, or Burials—Duty of 1*d.* imposed from April 3, 1860.
Cost Book Mines, on transfer of shares, &c.—Duty of 6*d.* imposed from April 3, 1860.
Contract Notes for sale or purchase of Government or other Public Stocks, Shares, &c. of the value of 5*l.* or upwards—Duty of 1*d.* imposed from August 28, 1860.
Awards—New Duties (ad valorem) from 2*s.* 6*d.* to 35*s.*, in lieu of a fixed duty of 35*s.*, from August 28, 1860.
Foreign Promissory Notes for payment of money within the United Kingdom—The same duty as Inland Bills of Exchange for payment of money otherwise than on demand, from August 28, 1860.
Inland Promissory Notes exceeding 4,000*l.*, same Duty as Inland Bills.
Policies for Accidental Death, Personal Injury, or loss, or damage of Glass (except by Fire)—Duties from 1*d.* to 3*d.* imposed from August 28, 1860.
Inland Bills of Exchange—Duty of 2*l.* 5*s.* for any sum of money exceeding 4,000*l.* repealed, and an ad valorem duty of 10*s.* for every 1,000*l.* or fractional part thereof, imposed from April 3, 1860.
Foreign Bills of Exchange drawn in sets—Duty of 3*s.* 4*d.* imposed for each Bill of a set exceeding 4,000*l.* or fractional part thereof, from April 3, 1860.
Foreign Bills of Exchange on demand, drawn abroad, same duties imposed as on Bills payable after date, in lieu of the duty of 1*d.* from April 3, 1860.
Declaration in lieu of an Affidavit—Duty of 2*s.* 6*d.* imposed from April 3, 1860.
Agreements under hand only, relative to matter of the value of 5*l.* or upwards, reduced from 2*s.* 6*d.* to 6*d.*, from April 3, 1860.
Agreements for Leases not exceeding seven years, charged as Leases, from April 3, 1860.
Life Policies for any sum not exceeding 25*l.*—Duty reduced from 6*d.* to 3*d.* from August 28, 1860.
Power of Attorney for the sale of Government Stock, not exceeding in value 20*l.*, or the receipt of annual sums not exceeding 10*l.*—Duty reduced from 1*l.* to 5*s.* from April 3, 1860.

ALTERATIONS IN THE RATES OF DUTIES, &c.—*continued.*

1861:—Foreign Bills of Exchange for the payment of money exceeding 500*l.* drawn out of the United Kingdom.—New Duty of 1*s.* for every 100*l.* imposed from June 28, 1861.
Leases of Furnished Houses for a term less than a year, or Agreements, &c., where the rent exceeds 25*l.*—Duty of 2*s.* 6*d.* imposed from June 28, 1861.
House Agents letting Furnished Houses exceeding the rent or value of 25*l.*—New Licence Duty imposed from July 5, 1861.
Hawkers' and Pedlars' Licences, Great Britain.—Duties reduced various rates from July 31, 1861.
Protests and other Notarial Acts—Duties altered and reduced from 1*d.* to 1*s.*, in lieu of from 2*s.* to 10*s.*, from August 6, 1861.
Proxy by Letter or Power of Attorney, to vote at any meeting of Proprietors, &c., of Institutions for purposes of Education or Charity—Duty reduced from 30*s.* to 6*d.* from August 6, 1861.

1862:—Cards—Duty reduced from 1*s.* to 3*d.* per pack, from September 1, 1862, per Act 25 Vict. c. 22.
Card Licences—To Makers of Cards or Dice, duty of 5*s.* repealed. Persons selling Playing Cards, if a maker, a duty of 1*l.* imposed; if not a maker, 2*s.* 6*d.*, per Act 25 Vict. c. 22.
Licences to Hawkers and Pedlars (with One Horse), duty of 8*l.* reduced to 4*l.* (Great Britain), per Act 25 Vict. c. 22.
Bonds or other Security for Foreign or Colonial Loans—Same duty imposed as is chargeable on other Bonds, from June 3, 1862, per Act 25 Vict. c. 22.
Land Registry Fee Stamps—Duties at various rates imposed from October 15, 1862, (England), per Act 25 & 26 Vict. c. 53.

1864:—Admissions to Ecclesiastical Benefices, &c. of small Value—Duties graduated from 5*l.* the previous minimum, to 1*l.*, according to the yearly value of the benefice, per Act 27 Vict., c. 18.
Proxies to vote at meetings of Joint Stock Companies—Duty reduced from 6*d.* to 1*d.*, per Act 27 Vict. c. 18.
Voting Paper, for voting at meetings of Joint Stock Companies, &c.—A Duty of 1*d.* imposed, per Act 27 Vict. c. 18.
Letters or Powers of Attorney for the Sale of Stock or Receipt of Dividends—Duty reduced, per Act 27 & 28 Vict. c. 56.
Fire Insurances on Stock in Trade—Duty reduced from 3*s.* to 1*s.* 6*d.* for every 100*l.* insured from 25th June 1864, per Act 27 Vict. c. 18.
Probates and Letters of Administration exempted from Stamp Duties where the Effects do not exceed 100*l.*, from 25th July 1864, per Act 27 & 28 Vict. c. 56.
Licences transferred to the Excise, except Attorneys', &c., Bankers', and Stage and Hackney Carriage Drivers', per Act 27 & 28 Vict. c. 56.
Registration of Deeds Fee Stamps, Ireland—Fees to be collected by means of Stamps, per Act 27 & 28 Vict. c. 76. Various rates imposed.

A

C 2

Inland Revenue (Taxes).

An Account of the Gross Receipt of Land and Assessed Taxes, and Property and Income Taxes, in the Years 1855, 1856, 1857, 1858, 1859, 1860, 1861, 1862, 1863, and 1864.

	1855. Ended Mar. 31, 1856.	1856. Ended Mar. 31, 1857.	1857. Ended Mar. 31, 1858.	1858. Ended Mar. 31, 1859.	1859. Ended Mar. 31, 1860.	1860. Ended Mar. 31, 1861.	1861. Ended Mar. 31, 1862.	1862. Ended Mar. 31, 1863.	1863. Ended Mar. 31, 1864.	1864. Ended Mar. 31, 1855.
England.	£	£	£	£	£	£	£	£	£	£
Land Tax on Lands and Tenements	1,123,877	1,115,334	1,108,315	1,100,081	1,106,190	1,113,869	1,104,077	1,092,950	1,100,626	1,099,296
Schedule. Assessed Taxes.										
B. Inhabited Houses	679,939	683,525	700,531	713,899	744,789	769,867	772,641	788,471	840,781	857,919
C. Servants	168,487	171,479	173,447	176,204	180,933	184,692	183,772	186,210	190,830	193,234
D. Carriages	260,482	267,333	274,460	280,856	291,917	302,471	304,314	310,741	320,527	327,634
E. Horses for Riding, &c.	212,406	216,091	213,529	211,480	217,274	222,492	220,935	223,265	228,020	230,792
F. Other Horses and Mules	98,444	100,436	103,890	105,219	108,441	112,373	113,884	116,152	120,128	123,355
G. Dogs	188,291	181,524	175,265	171,944	173,702	177,669	176,641	179,691	184,757	189,380
H. Horse Dealers	12,192	12,167	11,466	12,067	12,649	12,303	12,583	12,640	12,188	12,265
I. Hair Powder	1,344	1,252	1,202	1,141	1,135	1,101	1,053	1,020	999	974
K. Armorial Bearings	49,327	48,046	48,367	48,654	50,344	52,094	51,871	53,116	54,892	56,080
L. Game Duties	114,252	114,255	118,697	128,085	134,060	3,669	—	—	—	—
Additional £10 per Cent., by 3 Vict. c. 17.	10,375	13,497	13,015	14,182	14,671	1,986	1,258	1,264	1,219	1,227
	2,910,416	2,924,963	2,942,184	2,963,792	3,036,105	2,954,586	2,943,029	2,965,520	3,054,967	3,092,156
Composition Duty	5,601	5,107	—	—	—	—	—	—	—	—
Land and Assessed Taxes	2,925,017	2,930,070	2,942,184	2,963,792	3,036,105	2,954,586	2,943,029	2,965,520	3,054,967	3,092,156
Property and Income Tax	12,879,533	13,841,806	10,115,443	5,818,659	8,246,494	9,492,963	9,071,428	9,111,943	7,975,364	6,955,258
Total	15,804,550	16,771,876	13,057,627	8,782,451	11,282,599	12,447,549	12,014,457	12,077,463	11,030,331	10,047,414
Scotland.										
Land Tax on Lands and Tenements	37,324	38,010	38,683	35,596	35,296	35,455	35,055	35,189	34,998	35,008
Schedule. Assessed Taxes.										
B. Inhabited Houses	49,030	45,001	53,682	50,042	52,121	53,117	54,089	56,286	57,657	59,082
C. Servants	17,411	16,490	19,355	17,193	17,364	17,458	17,679	17,781	18,076	18,253
D. Carriages	23,482	22,703	26,209	25,906	27,417	27,819	28,578	29,492	30,446	31,342
E. Horses for Riding, &c.	19,278	18,212	20,899	19,137	19,715	19,996	20,241	20,397	20,607	20,680
F. Other Horses and Mules	10,902	10,750	12,766	12,600	13,256	13,450	13,867	14,005	14,196	14,667
G. Dogs	20,703	19,280	22,386	19,825	19,969	19,869	19,975	20,304	20,602	21,030
H. Horse Dealers	1,631	1,612	1,732	1,690	1,490	1,821	1,734	1,513	1,438	1,325
I. Hair Powder	61	62	64	58	56	56	63	52	53	54
K. Armorial Bearings	4,442	4,490	5,142	4,929	5,067	5,044	5,139	5,274	5,316	5,481
L. Game Duties	11,112	10,824	11,289	11,177	11,911	83	—	—	—	—
Additional £10 per Cent., by 3 Vict. c. 17.	1,541	1,344	1,305	1,117	1,340	—	173	151	144	133
	196,917	188,778	213,532	199,270	205,002	194,168	196,593	200,444	203,533	207,055
Composition Duty	230	222	—	—	—	—	—	—	—	—
Land and Assessed Taxes	197,147	189,000	213,532	199,270	205,002	194,168	196,593	200,444	203,533	207,055
Property and Income Tax	1,344,367	1,319,476	755,522	456,698	810,718	912,238	876,074	894,613	690,670	698,845
Total	1,541,514	1,508,476	969,054	655,968	1,015,720	1,106,406	1,072,667	1,095,057	894,203	905,900

IRELAND.										
Property and Income Tax	1,179,001	1,223,212	896,841	536,875	732,271	753,682	740,499	703,322	649,211	534,775
GREAT BRITAIN.										
Land Tax on Lands and Tenements	1,161,201	1,153,344	1,146,998	1,135,677	1,141,486	1,149,324	1,139,132	1,128,139	1,135,624	1,134,304
Schedule. Assessed Taxes.										
B. Inhabited Houses	728,969	728,526	754,213	763,941	796,910	822,984	826,730	844,757	898,438	917,001
C. Servants	185,898	187,969	192,802	193,397	198,297	202,150	201,451	203,991	208,906	211,487
D. Carriages	283,964	290,036	300,669	306,762	319,334	330,290	332,892	340,233	350,973	358,976
E. Horses for Riding, &c.	231,684	234,303	234,428	230,617	236,989	242,488	241,176	243,662	248,627	251,472
F. Other Horses and Mules	109,346	111,210	116,656	117,819	121,697	125,823	127,751	130,157	134,324	138,022
G. Dogs	208,994	200,804	197,651	191,769	193,671	197,538	196,616	199,995	205,359	210,410
H. Horse Dealers	13,823	13,779	13,218	13,757	14,139	14,124	14,317	14,153	13,626	13,590
I. Hair Powder	1,405	1,314	1,266	1,199	1,191	1,157	1,116	1,072	1,052	1,028
K. Armorial Bearings	53,769	52,536	53,509	53,583	55,411	57,138	57,010	58,390	60,208	61,561
L. Game Duties	125,364	125,079	129,986	139,242	145,971	3,752	—	—	—	—
Additional 10*l.* per Cent., by 3 Vict. c. 17.	11,916	14,841	14,320	15,299	16,011	1,986	1,431	1,415	1,363	1,360
	3,116,333	3,113,741	3,155,716	3,163,062	3,241,107	3,148,754	3,139,622	3,165,964	3,258,500	3,299,211
Composition Duty	5,831	5,329	—	—	—	—	—	—	—	—
Land and Assessed Taxes	3,122,164	3,119,070	3,155,716	3,163,062	3,241,107	3,148,754	3,139,622	3,165,964	3,258,500	3,299,211
UNITED KINGDOM.										
*Property and Income Tax	15,402,901	16,384,494	11,767,306	6,812,232	9,789,483	11,158,883	10,688,001	10,709,878	9,315,245	8,188,578
TOTAL	18,525,065	19,503,564	14,923,022	9,975,294	13,030,590	14,307,637	13,827,623	13,875,842	12,573,745	11,488,089

ALTERATIONS IN THE RATES OF DUTIES, &c.

1855:—Property and Income Tax increased on Incomes of 150*l.* and upwards, 2*d.* in the pound.
And on Incomes between 100*l.* and 150*l.*, 1½*d.* in the pound, from April 5, 1855.

1857:—Property and Income Tax reduced as follows:—
Incomes of 150*l.* and upwards, from 16*d.* to 7*d.* in the pound.
Incomes between 100*l.* and 150*l.*, from 11½*d.* to 5*d.* in the pound, from April 5, 1857.
Tax on Race-Horses transferred to the Excise Revenue from April 5, 1857.
Composition Duty ceased, per Act 16 & 17 Vict. c. 90.

1858:—Property and Income Tax reduced on Incomes of 150*l.* a year and upwards to 5*d.* in the pound, from April 5, 1858.

1859:—Property and Income Tax. In addition to the rate of 5*d.* in the pound on all Incomes above 100*l.* a year, further rates imposed from April 5, 1859, per Act 22 and 23 Vict. cap. 18,—viz. 4*d.* in the pound on incomes of 150*l.* a year and upwards, 1½*d.* in the pound on incomes between 100*l.* and 150*l.* a year.

1860:—Game Certificates. Duties transferred to the Excise Revenue from August 13, 1860, per Act 23 & 24 Vic. c. 90.

ALTERATIONS IN THE RATES OF DUTIES, &c.—*continued.*

Property and Income Tax. Rates imposed from April 5, 1860, per Act 23 & 24 Vict. cap. 14:—
Incomes of 150*l.* and upwards, 10*d.* in the pound.
Incomes between 100*l.* and 150*l.*, 7*d.* in the pound.

1861:—Property and Income Tax. Rates imposed from 5th April 1861, per Act 24 Vic. c. 20:—
Incomes of 150*l.* and upwards, 9*d.* in the pound.
Incomes between 100*l.* and 150*l.*, 6*d.* in the pound.

1862:—Property and Income Tax. Rates imposed from April 5, 1862, per Act 25 Vict. c. 22:—
Incomes of 150*l.* and upwards, 9*d.* in the pound.
Incomes between 100*l.* and 150*l.*, 6*d.* in the pound.

1863:—Property and Income Tax. Rates imposed from April 5, 1863, per Act 26 Vict. c. 22:—
Incomes of 100*l.* and upwards, 7*d.* in the pound.
Allowance of 60*l.* to incomes under 200*l.*

1864:—Property and Income Tax. Rates imposed from April 5th, 1864, per Act 27 Vict. c. 18:—
Incomes of 100*l.* and upwards, 6*d.* in the pound.

SCHEDULE.										
* Appropriation of the Gross Receipt of Property and Income Tax to Schedules — A. Land, &c.	7,106,232	7,583,111	5,578,253	3,188,038	4,532,870	5,136,623	5,044,655	5,060,656	4,343,126	3,803,830
B. Occupation	852,256	901,430	654,907	384,564	549,509	611,929	587,738	592,080	501,433	436,654
C. Funds	1,777,457	1,890,282	1,093,172	741,087	1,040,775	1,187,821	1,024,925	1,062,802	957,186	754,260
D. Trades and Professions	4,749,181	4,970,434	3,681,488	2,059,394	3,012,935	3,462,886	3,331,502	3,303,691	2,904,943	2,675,077
E. Profits of Office	917,775	1,039,237	759,486	439,149	653,394	759,624	699,181	690,649	608,557	519,057
	15,402,901	16,384,494	11,767,306	6,812,232	9,789,483	11,158,883	10,688,001	10,709,878	9,315,245	8,188,878

Excise.

An Account of the Quantities of each Article charged with Duty in England, Scotland, and Ireland respectively, in the Years ended the 31st March 1864 and 1865.

Articles charged.	Quantities charged. Years ended 31st March 1864. England.	Scotland.	Ireland.	United Kingdom.	1865. England.	Scotland.	Ireland.	United Kingdom.
Spirits - Gallons	8,835,727	6,703,256	4,692,143	20,231,126	9,165,781	7,131,877	4,941,208	21,238,866
Malt - Bushels	43,569,186	1,955,363	2,411,400	47,935,949	43,955,938	2,092,700	2,489,774	48,538,412
Race Horses - No.	1,893	- -	- -	1,893	2,012	- -	- -	2,012
Railways, Amount received for Conveyance of Passengers chargeable with Duty.	£7,443,462	£641,630	- -	£8,085,092	£8,213,227	£682,518	- -	£8,895,745
Licences - No.	703,726	65,067	89,008	857,801	775,448	71,379	90,302	937,129
Sugar (Home-made) Cwts.	—	—	—	—	1,064	- -	- -	1,064
Sugar (used by Brewers) Cwts.	—	—	—	—	29,239	1,644	705	31,588
Hackney Carriages, No.	6,647	- -	- -	6,647	7,037	- -	- -	7,037
Stage Carriages No.	4,753	685	- -	5,438	11,612	437	- -	12,049
Chicory - Cwts.	11,016	- -	- -	11,016	5,752	- -	- -	5,752

Duties.	Amount of Duty charged. Years ended 31st March 1864. England.	Scotland.	Ireland.	United Kingdom.	1865. England.	Scotland.	Ireland.	United Kingdom.
	£	£	£	£	£	£	£	£
Spirits - - -	4,417,864	3,351,628	2,346,071	10,115,563	4,582,891	3,565,939	2,470,604	10,619,434
Malt - - - -	5,909,070	263,954	326,080	6,499,104	5,961,524	282,516	337,565	6,581,605
Race Horses - -	7,288	- -	- - -	7,288	7,746	- -	- - -	7,746
Railways - - -	372,173	32,081	- - -	404,254	410,661	34,126	- - -	444,787
Licences - - - -	1,677,687	162,210	157,539	1,997,436	1,827,152	173,696	158,956	2,159,804
Sugar (Home-made) -	—	—	—	—	497	- -	- -	497
Sugar (used by Brewers)	—	—	—	—	4,873	274	118	5,265
Hackney Carriages -	98,489	- -	- - -	98,489	103,207	- -	- - -	103,207
Stage Carriages - -	119,999	9,017	- - -	129,016	118,303	9,328	- - -	127,631
Chicory - -	10,404	- - -	-	10,404	6,975	- -	- - -	6,975

AN ACCOUNT showing the Consumption of Home-made Spirits in England, Scotland, and Ireland respectively, in the Year ended the 31st March 1865 :—

—	Gallons.	Gallons.
ENGLAND.		
Spirits distilled in England on which duty was paid in England		6,421,101
Spirits imported from Scotland:		
Under Bond	2,169,024	
Duty paid	1,684,006	
		3,853,030
Spirits imported from Ireland:		
Under Bond	342,853	
Duty paid	762,196	
		1,105,049
Spirits on which duty was received by the Customs		232,801
		11,611,981
Deduct—		
Spirits sent to Scotland	8,169	
„ sent to Ireland	3,688	
„ exported on Drawback	226,866	
„ methylated	186,493	
		425,216
Number of gallons for Consumption as Beverage only, in England		11,186,765
SCOTLAND.		
Spirits distilled in Scotland on which Duty was paid in Scotland		7,022,062
Spirits imported from England:		
Under Bond	592	
Duty paid	8,169	
		8,761
Spirits imported from Ireland:		
Under Bond	1,340	
Duty paid	34,491	
		35,831
Spirits on which duty was received by the Customs		107,882
		7,174,536
Deduct—		
Spirits sent to England	1,684,006	
„ sent to Ireland	5,261	
„ exported on Drawback	347,778	
„ methylated	107,881	
		2,144,926
Number of gallons retained for Consumption, as Beverage only, in Scotland		5,029,610
IRELAND.		
Spirits distilled in Ireland on which Duty was paid in Ireland		3,974,588
Spirits imported from England:		
Under Bond	58,548	
Duty paid	3,688	
		62,236
Spirits imported from Scotland:		
Under Bond	661,733	
Duty paid	5,261	
		666,994
Spirits on which duty was received by the Customs		246,291
		4,950,109
Deduct—		
Spirits sent to England	762,196	
„ sent to Scotland	30,672	
„ exported on Drawback	—	
„ methylated	—	
		792,868
Number of gallons retained for Consumption, as Beverage only, in Ireland		4,157,241

Exportation of Spirits.

Account of the Number of Gallons of British Spirits exported from the United Kingdom in the Years ended 31st March 1864 and 1865.

To what Countries.	1864.	1865.
	Gallons.	Gallons.
To Channel Islands - - -	27,879	10,783
„ France - - -	637,317	434,915
„ Portugal - - -	1,447,920	1,465,193
„ Sardinia - - -	80,453	4,668
„ Tuscany - - -	426	30,419
„ Naples and Sicily - - -	89,435	39,820
„ Turkey - - -	299,615	118,702
„ West Coast of Africa (Foreign) -	281,287	264,283
„ British India - - -	85,548	66,492
„ Australia - - - -	602,853	268,597
„ British North America - -	136,461	108,284
„ United States of America - -	147,351	49,850
„ other Countries - - -	544,671	513,134
Total - - -	4,381,216	3,375,140

Assessed Taxes.

An Account of the Articles charged to the Assessed Taxes in the Years ended 5th April 1863 and 1864, and the Amount of Duty thereon.

	Year ended 5th April 1863.				Year ended 5th April 1864.			
	No. of Articles charged.	Amount of Duty.			No. of Articles charged.	Amount of Duty.		
		£	s.	d.		£	s.	d.
Houses—at 9*d.* in the pound	363,302	667,756	7	1	374,959	690,361	19	6
Do. 6*d.* do.	214,319	244,249	13	11	219,131	249,056	9	4
Servants	248,222	211,881	12	0	253,575	216,659	2	0
Carriages—								
With four wheels, drawn by two or more Horses	29,551	100,687	2	6	30,418	103,794	5	0
Do. do., by one Horse	69,268	125,640	10	0	72,468	131,639	10	0
Do. with less than four wheels, drawn by two or more Horses	227	439	0	0	232	455	0	0
Do. do., drawn by one Horse	167,316	118,786	12	6	170,517	120,871	2	6
Do. used by Common Carriers	6,203	10,529	13	4	6,362	10,780	13	4
Horses—								
Horses exceeding thirteen hands used for riding and drawing Carriages chargeable with duty	172,112	180,717	12	0	176,774	185,612	14	0
Do. used by farmers, clergymen, surgeons, &c.	136,168	71,488	4	0	136,990	71,919	15	0
Do. exceeding thirteen hands, used in trade	194,046	101,874	3	0	201,427	105,749	3	6
Do. not exceeding thirteen hands	75,189	34,315	16	9	77,876	35,472	18	9
Dogs	347,389	208,213	16	0	359,559	215,523	12	0
Horse Dealers	1,050	15,207	10	0	1,061	15,331	5	0
Hair Powder	913	1,072	15	6	914	1,073	19	0
Armorial Bearings	50,255	61,119	8	9	52,360	63,095	0	5
		2,153,979	17	4		2,217,396	9	4

Property and Income Tax.

An Account showing the Annual Amount of Property and Income charged under each Schedule of the Income Tax Act, for the Years ended 5th April 1863 and 1864, and the Amount of Tax thereon.

Schedules.	Year ended 5th April 1863.					Year ended 5th April 1864.				
	Amount of Property and Income charged in				Amount of Duty charged.	Amount of Property and Income charged in				Amount of Duty charged.
	England.	Scotland.	Ireland.	United Kingdom.		England.	Scotland.	Ireland.	United Kingdom.	
	£	£	£	£	£	£	£	£	£	£
A. -	112,208,357	13,853,218	13,494,091	139,555,666	5,218,982	113,445,596	13,997,418	13,470,000	140,913,714	4,109,304
B. -	28,223,461	3,881,881	2,940,495	35,045,837	602,154	27,861,718	3,617,496	2,930,874	34,410,088	471,711
C. -	29,528,213	—	1,124,400	30,652,613	1,149,473	30,411,687	—	1,200,442	31,612,129	919,587
D. -	85,088,087	8,234,777	4,666,609	97,989,473	3,544,239	87,307,979	8,536,243	4,368,610	100,212,832	2,922,980
E. -	18,356,800	1,106,235	1,234,976	20,698,011	733,793	17,487,270	986,761	1,152,707	19,626,738	573,850
	273,404,918	27,076,111	23,460,571	323,941,600	11,248,641	276,514,250	27,137,918	23,123,333	326,775,501	9,001,432

Report from the Principal of the Laboratory.

In my last Report I alluded to the fact that owing to recent legislation the business of the Laboratory had altered considerably in character, and that, although the aggregate number of samples examined during the year was much less than the number examined in the previous year, the amount of work performed was much greater. In reverting to this subject, at the risk of being charged with giving undue prominence to it, I am actuated solely by a desire to show that the operations of my department, as subsidiary to a highly organized system of levying and securing a large revenue, have not lessened, but are steadily increasing in importance. That this should be the case is not surprising, as the invention and adroitness brought to bear on the acquisition of wealth are daily becoming more refined, and more adopted by enterprising persons. Occasionally bold attempts are made to circumvent the revenue under the guise of new and legitimate objects of trade, whilst it not infrequently happens that complaints are made that the existing fiscal restrictions imposed on the production and assessment of dutiable commodities are unnecessarily stringent, and that a relaxation of such restrictions might safely be allowed. Some of these complaints are, no doubt, well founded and deserving of serious attention, but others are insidious, and the pleas upon which they are based require to be examined with the utmost care, under the guidance of the laws and regulations relating to the collection of the revenue, and also by scientific investigations of the modified processes which may be proposed as beneficial to trade, but which, if sanctioned, might lead to frauds on the revenue. Thus the number of samples analysed does not give a full idea of the extent of the business of the Laboratory, as the researches and investigations undertaken for special objects, and which demand much time and thought, are not included. As an instance, it may be proper to mention the following case which is now depending. The hop-planters of Kent, being desirous to avail themselves of duty-free tobacco for the purpose of destroying the insects which infest the hop-plant, memoralized Government on the subject, and the question being submitted to me, a series of experiments were at once commenced to discover some mode by which the extract of tobacco intended to be used might be rendered unfit for the purposes of fraudulent tobacco manufacturers, without causing it to be injurious to the hop-plant. The problem may appear simple, but it was soon found to be very difficult of solution, and all the substances hitherto tried, which, when added to the tobacco extract, could not again be separated effectually, and which would prevent an improper use of such extract, have proved to be injurious to vegetation. Experiments are still going on, and I hope to be able soon to surmount the difficulty.

During the last financial year the Act allowing duty-free malt to be used in the feeding of animals came into operation, and up to the 31st March last 519 samples of mixtures of malt and linseed prepared for the purpose mentioned, and 365 samples of ground linseed alone, had been examined in the Laboratory; and it is satisfactory to be able to state that, with two or three exceptions, the whole of the samples were found to be totally unfit for the brewing of beer, thus proving that the revenue derived from malt is not, as it was by some feared it would be, endangered under the provisions of the Act in question.

The stringent measures adopted by the Customs to prevent the importation of simulated wines are still continued, and 182 samples have within the year been examined, of which 102 were found to be composed chiefly of factitious wine, whilst nearly the whole of the remaining

80 were of very low value, and, although genuine wine predominated more or less in their composition, they still contained considerable proportions of spurious wine. There can be no doubt but that these made-up liquids would, but for the energetical action of the Customs, have passed into consumption either *per se* as sherry or mixed with genuine wine.

Within the past year two manufactories have been established in London for the purpose of preparing glucose or starch sugar for the use of brewers, and as this sugar differs considerably both in value and character from cane sugar, to which alone the existing rates of duty apply, it has become necessary, for the purposes of assessment, to determine the ratio of dutiable value of the two descriptions of sugar, and for this end 12 samples of glucose have been analysed.

Analyses for the Customs continue to form a considerable proportion of the work devolving on the Laboratory, as during the past year no less than 2,259 samples were examined for that branch of the revenue.

The progress of the business of the Laboratory for the last four years will be seen from the following table, in which the samples of coffee and mixtures of chicory and coffee are distinguished from the other samples.

Year.	Number of Samples examined, excluding Coffee and Chicory, and also those from Customs.	Number of Samples examined.		Total Number of Samples examined.	Increase.	Decrease.
		Coffee and Mixtures of Chicory and Coffee.	From the Customs.			
1861	8,364	3,045	22	11,431	—	—
1862	6,251	5,088	21	11,360	—	71
1863	6,309	25	2,254	8,588	—	2,772
1864	8,388	61	2,259	10,708	2,120	—

Thus, during the period to which the above table refers no less than 42,000 samples have been analysed, an amount of work the results of which cannot have failed to exercise a beneficial effect not only upon the interests of the revenue, but upon those of the community in general.

In the educational branch of the Laboratory ten young officers have, since the date of my last Report, completed a course of study in chemistry, and in their final examination by Dr. Hofmann they acquitted themselves in such a manner as to draw from that gentleman a very high encomium. This satisfactory result is mainly due to the intelligence and assiduity of the students themselves, who, in common with their predecessors, have shown a desire to profit to the utmost by the opportunity afforded them of obtaining scientific knowledge, and have evinced an earnest and praiseworthy determination to merit the approbation of the Board. Fifty-nine students have now passed through a course of education in chemistry, and it is perhaps not too much to say that they form a valuable reserve from which officers may be selected to assist in securing the revenue in those cases in which it may be advantageous to make their scientific knowledge available. At the present time only six students are under instruction, as owing to the limited space at the disposal of the department, and the increase of the practical business of the Laboratory, it was found difficult to spare room for more.

During the period to which this Report relates fourteen examiners have received in the Laboratory a month's instruction in the modes of detecting the adulteration of articles subject to revenue duties ; 170 of these officers, whose position in the service is highly onerous and demands much intelligence and practical knowledge, have passed, on the whole, with great credit through my Department.

TOBACCO.

The condition of the trade in this important commodity, so far at least as relates to the question of adulteration, continues in a most healthy state ; it cannot, of course, be supposed that an article upon which is imposed a duty of about 500 per cent. on its value, should escape the attention of the smuggler or the adulterator, and it can only have been by well directed and sustained efforts that frauds on the tobacco revenue have been kept down to a minimum which is insignificant when compared with the large yearly duty derived from the article, and the following table may not be uninteresting, as showing that the consumption of duty-paid tobacco has more than kept pace with the increase of population in the United Kingdom.

Year.	Total population of Great Britain, and approximately of Ireland.	Pounds weight of Tobacco cleared for consumption in the United Kingdom.	Weight of Tobacco yearly consumed per head of the population.	
			lbs.	oz.
1841	26,700,000	23,096,281	0	$13\frac{3}{4}$
1851	27,347,000	27,734,786	1	$0\frac{1}{4}$
1861	28,887,000	35,413,846	1	$3\frac{1}{2}$
1863	29,195,000	37,636,240	1	$4\frac{1}{2}$
Population estimated according to the per centage increase during the decennial period from 1851 to 1861.				

A few cases of the adulteration of tobacco with liquorice have been detected during the past year, but the quantity of liquorice used was very small. In two instances which occurred in London the tobacco contained not more than one per cent. of the illicit ingredient. The practice of illegally using liquorice and other saccharine matter still lingers in Ireland, but the numerous detections which were some time ago made, and the penalties imposed, appear to have had a salutary effect, as the fraud when now committed seems to be done timidly, and not in that gross and daring manner which was the case when the offenders were under the impression that the revenue possessed no satisfactory means of proving, by analysis, the commission of the fraud.

As in previous years, I have myself closely inspected a large number of the tobacco manufactories in the kingdom, and I am in a position to say, from my own observation, that the adulteration of tobacco is now almost nominal.

It will be seen from the following table that it has been deemed necessary to examine 158 samples under a suspicion that they were illicit, but of these only 34 were adulterated, the most of them to so slight an extent as to lead to the inference that the object was not so much to defraud the revenue as to impart a particular character to the tobacco.

TABLE showing the number of SAMPLES of TOBACCO analysed in the Laboratory in the years 1862, 1863, and 1864.

Year.	Number of Samples.		
	Genuine.	Adulterated.	Total.
1862 - -	56	48	104
1863 - -	69	31	100
1864 - -	124	34	158

Of the adulterated samples, three contained cane sugar, four cane sugar and liquorice, fourteen liquorice, four coltsfoot, one cabbage leaves, two sulphate of iron, one lamp-black, whilst five samples of "fancy tobaccos" contained stramonium, coltsfoot, lavender, and southernwood.

SNUFF.

The adulteration of snuff with large quantities of lime still continues to be practised in Ireland, the existing law being insufficient for its suppression. In my last Report I dwelt at some length upon this subject, and endeavoured to point out the pernicious effects of the fraud, and that the use of lime in the manufacture of snuff was not only unnecessary but that it actually depreciated the value of the commodity. It may be reasonably supposed that those manufacturers who have adopted the reprehensible practice will, finding that the revenue is at present powerless to repress their unscrupulous operations, avail themselves of the opportunity to increase, as far as possible, the proportion of lime which they add to their snuff: that they are doing this is, I think, proved by the fact that several samples of high dried snuff from Ireland have been recently analysed and found to contain lime in proportions varying from 20 to 25 per cent., quantities considerably in excess of those found in previous years. The adulteration of snuff by other materials than lime is now, I believe, but seldom attempted, and this absence of fraud in the trade is no doubt partly due to the conviction which the fraudulent manufacturers have, from costly experience, at length arrived at, that owing to improved modes of analysis, the efficient use of the microscope, and the vigilant supervision of the revenue officers, it has become very unsafe to sophisticate their commodities ; and partly to the sufficiency of the law to deal with such cases of fraud, and to the large penalties imposed when the fact of adulteration has been proved.

Only one detection of importance of the adulteration of snuff with materials other than lime has been made during the past year, about half a ton of snuff containing a large proportion of ground fustic having been seized on the premises of a manufacturer in London. Two samples were also found to contain about 58 per cent. of sand.

SAMPLES of SNUFF analysed.

Year.	Number of Samples.		
	Genuine.	Adulterated.	Total
1862 - -	8	4	12
1863 - -	32	25	57
1864 - -	4	16	20

TOBACCO AND SNUFF EXPORTED ON DRAWBACK OF DUTY.

The "Manufactured Tobacco Act" of 1863 has, I believe, on the whole, fulfilled the purposes for which it was framed. That portion of it which relates to the exportation on drawback has up to the present time been found to operate most satisfactorily, as the amount of duty to be repaid by the revenue is now accurately determined according to the quality and condition of the tobacco when presented for exportation. It may not be improper to place upon record the particulars contained in the following table, as they may be interesting for reference and comparison in future years.

SAMPLES of MANUFACTURED TOBACCO exported on Drawback, examined in the Years ended 31st March 1864 and 1865.

Description of Samples.	Number of Samples.		Pounds weight of Tobacco represented by the Samples.		Mean Per-centage of Moisture in the Samples.		Mean Amount of Drawback of Duty per Pound.	
	1864.	1865.	1864.	1865.	1864.	1865.	1864.	1865.
							s. *d.*	*s.* *d.*
Cut tobacco	1,452	1,405	121·085	102·343	28·93	27·60	2 $7\frac{85}{100}$	2 $8\frac{45}{100}$
"Bird's-eye"	105	158	6·334	12·683	23·04	20·94	2 $10\frac{49}{100}$	2 $11\frac{61}{100}$
Roll	110	76	53·837	58·572	43·09	41·93	2 $1\frac{51}{100}$	2 $2\frac{8}{100}$
Cavendish	49	53	2·123	2·094	29·03	25·60	2 $7\frac{81}{100}$	2 $9\frac{88}{100}$
Cigars	11	16	·916	1·605	12·87	12·87	3 $3\frac{4}{100}$	3 $3\frac{4}{100}$
Cigarettes	30	38	1·138	2·685	13·42	13·28	3 $2\frac{81}{100}$	3 $2\frac{87}{100}$
Total	1,757	1,746	185·433	179·922	32·66	31·42	2 $6\frac{18}{100}$	2 $6\frac{74}{100}$

The most noticeable feature in the preceding comparative table is that the average amount of moisture present in the tobacco exported last year was more than one per cent. less than that contained in the tobacco exported during the previous year. This improvement in the quality of the tobacco is not improbably due to the operation of the recent Act, as the exporters have not now, as they formerly had, any advantage at the expense of the revenue by loading their goods with water.

During the year, 1,746 samples of tobacco and 260 of snuff, making a total of 2,006 samples, have been examined for the purpose of assessing the drawback. Not the least difficulty is experienced in making these examinations, and the Customs are generally made acquainted with the results within two days after the samples are received.

The exportation of snuff has increased considerably during the past year. This is chiefly owing to the fact that some manufacturers, whose principal business is the production of "shag" tobacco, or cut tobacco prepared from leaf from which the stalk has been removed, have availed themselves of the privilege now accorded of grinding up their surplus stalks, for which they had previously but a very limited outlet, and exporting them on drawback in the form of snuff. The loss sustained by certain manufacturers from the undue accumulation of stalks on which the tobacco duty had been paid can now be in a great measure avoided, and an old and constant ground of complaint has been fairly removed.

The following table gives the particulars relating to the samples of snuff examined for drawback during the last two years:—

SAMPLES of SNUFF exported on Drawback examined in the Years ended 31st March 1864 and 1865.

Description of Samples.	Number of Samples examined.		Pounds weight of Snuff represented by the Samples.		1864. Mean Per-centage of			1865. Mean Per-centage of			Mean Amount of Drawback of Duty per Pound.	
	1864.	1865.	1864.	1865.	Moisture.	Inorganic Matter.	Organic Matter.	Moisture.	Inorganic Matter.	Organic Matter.	1864.	1865.
											s. *d.*	*s.* *d.*
High dried (Irish and Welsh).	26	37	5,431	20,641	7·95	23·74	68·31	6·90	23·61	69·49	3 $1\frac{34}{100}$	3 $1\frac{99}{100}$
Scotch - - -	150	141	50,872	66,786	13·64	25·18	61·18	12·59	24·05	63·36	2 $9\frac{44}{100}$	2 $10\frac{63}{100}$
Rappee - - -	174	82	10,973	3,070	38·85	23·39	37·76	39·85	23·93	36·22	1 $8\frac{64}{100}$	1 $7\frac{180}{100}$
Total - -	350	260	67,276	90,497	17·29	24·77	57·94	12·22	23·94	63·84	2 $7\frac{67}{100}$	2 $10\frac{89}{100}$

Upwards of 4,000 samples of tobacco and snuff exported on drawback have been examined during the two years that the "Manufactured Tobacco Act" has been in operation, and of this large number only one sample has been found which could not be deemed genuine.

PEPPER.

Perhaps no article subject to revenue duties is more sophisticated than pepper, a fact to which, in my former Reports, I have frequently adverted. That a substance which is only used in small quantities as a condiment should be so liable to adulteration may seem remarkable if the circumstance be overlooked that it may be mixed with its own weight of illicit and almost worthless ingredients without its being rendered unsaleable on the score of the want of pungency. It is not surprising, therefore, that needy and dishonest retailers should attempt to secure a little extra profit on an article which can be so easily tampered with, or that unscrupulous persons who may be extensively engaged in the grinding and sale of the commodity should seek to obtain large gains by resorting to the fraudulent practice.

The following narrative of a case of fraud which was discovered during the past year may not only be interesting, but serve to show the circuitous and cautious manner in which adulterated pepper is passed into consumption through the agency of the retailers. A supervisor in a remote part of Scotland purchased from a retailer a sample of pepper which appeared to him to be adulterated. After expressing his doubts to the trader (a woman) as to the genuineness of the article, she replied, that her opinion was that the pepper was "not what it ought to be." She also gave the name of the dealer in Glasgow who supplied the article, and produced the invoice, in which this so-called pepper was described, no doubt with a view to escape the consequences of detection, as "capsicums," which is a legitimate article of commerce. At the same time she mentioned the name of another retailer in the neighbourhood who was supplied by the same dealer, and on visiting his premises the supervisor made another purchase. Both these samples were forwarded to the Laboratory, and, on analysis, the first was found to consist of 25 per cent. of gypsum, the rest being mustard husks and a little cereal starch, and though a good imitation of pepper, it did not contain a trace of that article. The second sample consisted of 16 per cent. of gypsum, 44 per cent. of mustard husks, a little cereal starch, and the rest pepper.

The supervisor in Glasgow was directed to visit the premises of the dealer who supplied the above retailers, and on doing so, purchased a sample of black pepper, and a sample of an article much resembling pepper, which the dealer called "capsicums." The black pepper was found to be genuine, but the "capsicums" consisted of 6 per cent. of sand, 5 of gypsum, a little cereal starch, the rest being mustard husks. It contained no capsicum. The dealer had no licence to deal in pepper, and stated that he received his stock from a wholesale druggist in Liverpool, but on the inspection of the premises of the latter by the officers in Liverpool no adulterated pepper, nor any substance prepared to imitate pepper, could be found.

The dealer in Glasgow was prosecuted and convicted on two counts, viz., for selling pepper without a licence, and for having in his possession an article prepared to imitate, and intended to be used as, pepper.

SAMPLES of MALT examined.

Samples.	Number of Samples examined.	Average Per-centage of ungerminated Grain in Samples.
For remission of duty on the ground of defective germination - - -	156	34·2
For exportation on drawback - - -	170	1·2
Taken from malt roasters, and containing not more than 5 per cent. of ungerminated corns - - - -	2	2·9
Taken from malt roasters, and containing more than 5 per cent. of ungerminated corns - - - -	57	38·0
Examined for other objects - - -	9	—
Total number of Samples examined in 1864 -	394	—
„ „ „ 1863 -	388	—
„ „ „ 1862 -	327	—

BEER EXPORTED ON DRAWBACK.

The examination of beer exported on drawback is one of the most important duties of my Department, and by it an efficient check is kept upon the declarations made by the exporters of the strength, or, in other words, the dutiable value of the beer, and the revenue protected against the loss which would, in many cases, otherwise arise from the claiming of a higher rate of drawback than that due to the beer exported.

The existing legalized process for ascertaining the original gravity of beer has been in operation about twelve years, and is now well established, and generally admitted to be just by those concerned in the shipment of beer. One exporter, however, has made strenuous exertions to show that it gives false results and operates most unfairly against his interests, and for a long time his opposition to the process has been very undisguised, in consequence, no doubt, of large quantities of his beer having been frequently rejected for drawback on the score of deficiency of strength. It is not improbable that he believes that he is being injured by a mode of analysis which is not trustworthy, and that he may be suffering from irregularities in his own establishment ; but whatever may be the cause of his antagonism to the present mode of ascertaining original gravities of beer, I feel it right to state that the most scrupulous care has always been exercised to avoid even the suspicion of doing him the least injustice. Those exporters who are in the habit of sending beer abroad, and who

thoroughly understand the relation which exists between their transactions and the results obtained in the Laboratory, do not, with the above exception, make any complaints of moment against the action of the revenue, although it occasionally happens that they also are found to be disentitled to drawback on beer which they export.

During the past year 6,441 samples were examined, and 130 confirmatory experiments made, making a total of 6,571 analyses. The following table shows, for each of the last three years, the number of barrels of beer represented by the samples taken, the average number of barrels to each sample, and the per-centage of barrels found not to be entitled to the rate of drawback claimed.

Year.	Number of Samples examined.	Number of Barrels of Beer represented by the Samples.	Average Number of Barrels to each Sample examined.	Per-centage of the Barrels found to be not entitled to Drawback.	Number of Barrels in every 10,000 not entitled to Drawback.
1862	5,171	288·422	55	1·68	170
1863	5,116	283·424	55	1·26	127
1864	6,441	342·377	53	0·55	55

The beer exported to India for the use of Her Majesty's troops is invariably examined as to its strength. The number of samples tested during the past year is 1,400, representing 148,287 barrels, only one of which was below the contract gravity of 1,055°, the average gravity being 1057·96.

SAMPLES of Beer examined in the Laboratory as to their original Gravities in the Years 1863 and 1864.

Year.	Original Gravity of Beer, as declared by Exporter.	Beer entitled to the Drawback claimed.			Beer not entitled to the Drawback claimed.			Total Number of Barrels of Beer represented by the Samples.	Percentage of the Total Number of Barrels of Beer not entitled to Drawback.
		Number of Samples.	Number of Barrels represented by the Samples.	Mean Original Gravity.	Number of Samples.	Number of Barrels represented by the Samples.	Mean Original Gravity.		
1863 - -	1040	73	4,839	1043·39	6	250	1038·46	5,089	4·91
	1045	8	200	1050·78	1	3	1041·74	203	1·47
	1050	85	2,453	1058·18	6	139	1048·27	2,592	5·36
	1055	1,562	138,084	1058·51	18	206	1051·67	138,290	0·15
	1060	496	17,581	1063·85	39	571	1055·23	18,152	3·14
	1065	1,042	48,257	1068·81	30	600	1061·43	48,857	1·22
	1070	463	14,396	1073·39	10	76	1068·42	14,472	0·52
	1075	71	1,983	1077·97	15	250	1070·58	2,233	11·19
	1080	495	20,904	1081·41	20	167	1074·41	21,071	0·79
	1085	345	20,009	1087·54	26	657	1082·57	20,666	3·17
	1090	109	6,090	1093·35	17	607	1084·05	6,697	9·06
	1095	126	4,417	1097·40	4	23	1094·67	4,440	0·51
	1100	15	152	1103·37	2	4	1094·38	156	2·56
	1105	7	175	1109·82	3	19	1071·50	194	9·79
	1110	6	55	1112·76	—	—	—	55	—
	1115	3	16	1119·45	4	27	1103·54	43	62·79
	1120	—	—	—	—	—	—	—	—
	1125	9	214	1130·59	—	—	—	214	—
Total - -	—	4,915	279,825	—	201	3,599	—	283,424	1·26
Contract -	1055	997	110,844	1057·62	—	—	—	110,844	—
1864 - -	1040	101	5,261	1045·82	—	—	—	5,261	—
	1045	15	747	1049·46	3	55	1042·74	802	6·85
	1050	113	3,592	1057·44	—	—	—	3,592	—
	1055	2,026	174,058	1058·38	9	35	1051·13	174,093	0·02
	1060	910	38,883	1064·45	16	244	1058·21	39,127	0·06
	1065	1,220	50,265	1068·64	56	622	1062·93	50,887	1·22
	1070	480	11,547	1073·94	55	627	1065·91	12,174	5·15
	1075	122	3,686	1078·86	13	109	1068·66	3,795	2·87
	1080	672	27,162	1083·02	15	124	1076·45	27,286	0·45
	1085	355	18,430	1087·10	12	59	1079·05	18,489	0·31
	1090	104	4,337	1093·86	2	1	1084·05	4,338	0·02
	1095	99	1,983	1098·48	4	8	1091·64	1,991	0·40
	1100	13	179	1105·04	3	10	1095·16	189	5·29
	1105	5	58	1110·21	—	—	—	58	—
	1110	9	56	1117·84	—	—	—	56	—
	1115	1	3	1114·08	2	18	1108·33	21	85·71
	1120	—	—	—	—	—	—	—	—
	1125	6	218	1131·35	—	—	—	218	—
Total - -	—	6,251	340,465	—	190	1,912	—	342,377	0·55
Contract {	1050	1	394	1052·02	—	—	—	394	—
	1055	1,399	147,893	1057·97	—	—	—	147,893	—
TOTAL - -	—	1,400	148,287	—	—	—	—	148,287	—

WOOD NAPHTHA.

Efforts continue to be made by some ingenious persons to secure to themselves an improper advantage through the permission to use duty free spirits in arts and manufactures, and it is much to be regretted that this permission, which was prudentially granted, and which has conferred an almost incalculable benefit on the industrial pursuits of the country, should still be an incitant to attempts to injure not only the interests of the revenue but also those of the community.

Methods have from time to time been devised for the purpose of rendering methylated spirit potable, but none of these have, I believe, as yet been of a nature to cause any appreciably adverse effect on the revenue, whilst those who adopted them would incur heavy penalties, and be much more liable to detection than the ordinary illicit distiller.

Connected with this subject, however, a source of danger to the revenue has arisen, which was not contemplated when the permission to use duty-free spirit was first allowed—a person having recently adopted a process, the principles of which were published twenty years ago, by which he is enabled to purify wood naphtha to a degree which assimilates it, in physical characters, somewhat closely to vinous alcohol ; and although his product cannot, when alone, be deemed quite potable, it is such that might be mixed in large proportions with ordinary spirits, and thus passed into consumption as a beverage without being detected. It may be observed that this purified wood naphtha would be more likely to displace duty-paid spirits than methylated spirits, the cost of the latter being not one-third of that of the naphtha, the preparation of which is expensive, but it yet affords a large margin of profit as against the value of duty-paid spirits, there being no duty chargeable upon it, and no law to prevent its purification.

Within the past year several attempts have been made to import from the Continent, wood spirit containing large quantities of vinous alcohol, and there can be no doubt that the intending importers contemplated a fraud on the spirit revenue of this country. Samples of these mixtures were examined in the Laboratory at the request of the Customs, and I think it would be advisable to have all the wood spirit imported similarly tested.

A few instances have been discovered of the sale of drinks under the names of "Indianna brandee," "medicated whiskee," "pure Islay mountain," "Indian tincture," and "red currant cough elixir," the exciting principle of all of which was found to be hyponitrous ether prepared from methylated spirit. The above compounds were all highly stimulating, and it would appear that they are consumed by some of the poor, because they produce intoxication at the cost of only a few pence, whilst there are good reasons for believing that hyponitrous ether itself, and in some parts of Ireland even sulphuric ether, are used by the needy classes for the same object. It is difficult to see how this evil, so pernicious to the moral and physical welfare of those who indulge in it can be checked, as the substances under consideration possess more the character of medicines than of ordinary spirits, and may thus be legally kept and sold by any chemist.

During the year 139 samples of wood spirit were examined, the object being to ascertain that they were free from vinous alcohol, and suitable for methylating spirits of wine.

MISCELLANEOUS SAMPLES.

Under this head 217 samples have been analysed, including spirits, wines, cherry and raspberry brandies, medicated compounds, cane and starch sugars, molasses, treacle, methylated spirits, "Finish," vinegar, chocolate, cocoa, caramel, and cyder.

TOTAL NUMBER of SAMPLES ANALYSED in the Laboratory in each of the Years 1862, 1863, and 1864.

Description of Samples.	Number of Samples examined in		
	1862.	1863.	1864.
Tobacco	158	100	158
Snuff	34	57	20
Tobacco exported on drawback	—	1,765	1,746
Snuff exported on drawback	—	354	260
Pepper	8	30	13
Beer, and substances used in its adulteration	4	26	31
Tea	2	3	—
Coffee	5,088	25	61
Malt	327	388	394
Beer (original gravities)	5,465	5,380	6,571
Distillers' wash	16	5	32
Wood spirit	83	95	139
Malt for cattle feeding	—	—	884
Wines (Customs)	—	—	182
Miscellaneous samples	175	360	217
Total	11,360	8,588	10,708

PROBATE DUTY.

COURT OF EXCHEQUER CHAMBER, May 1864.

The Attorney General *v.* Partington.

A married woman, entitled as next of kin to the personal estate of an intestate, died without asserting her claim, leaving her husband surviving, who also died without asserting his claim.

Held, *that it was necessary for the next of kin of the husband, in order to enforce the right of the wife and reduce it into possession, to take out letters of administration to both husband and wife, and pay Stamp Duty upon the property for each grant of administration.*

Held, *also, (affirming the judgment of the Court of Exchequer,) that Stamp Duty upon Letters of Administration is to be calculated, not only on the principal money which constituted the property of the intestate at time of her death, but also upon accumulations of interest between the death and the grant of Letters of Administration.*

JUDGMENT.

Delivered by Willes J.—There were two questions for the considera- of the Court in this case—first, whether the stamp duty upon letters of administration is to be calculated upon the principal money only, which constituted the property at the time of the death, or also upon accumulations of interest between the death and the grant of letters of administration. Upon this point the Court of Exchequer gave judgment for the Crown, and we affirm that judgment.

The interest is a strict accessory to the estate of the intestate. It arose out of that estate as its produce. It followed the estate in point of property. Neither the principal nor the interest could be recovered without letters of administration, and when granted the letters of administration in effect included both, for they established the right to the one, as accessory to the other. Under those circumstances it is, apart from authority, in our opinion, plain upon the language of the 3rd schedule of 55 Geo. 3. c. 184, aided by reference to the 38th section of the same Act, that the interest, equally with the principal, is an "estate" and "effects," for or in respect of which the letters of administration were granted, and therefore in terms chargeable by that Act with the stamp duty.

We are justified in this construction by the authority of *Doe d. Richards* v. *Evans*,* which, indeed, we must treat as a case in point, for no sound distinction has been suggested for this purpose between an accretion and an accessory, nor can we discover any. To the same effect are the dicta of the lords in *Attorney General* v. *Brunning*.†

The second question is, whether if during marriage a wife acquires a right to a distributive share in an intestate estate, or a right to the entire estate as sole next of kin, and dies without asserting her claim, leaving her husband surviving, who dies without asserting his claim or taking out letters of administration to his wife, it is necessary for the next of kin of the husband, in order to enforce the right of the wife and reduce it into possession for their benefit, to take out letters of adminis-

* 10 Q. B. 476. † 8 House of Lords Cases 243.

tration to both wife and husband, and to pay stamp duty upon the property for each grant of administration.

This question was not much argued in the Court of Exchequer. The principal subject of consideration there appears to have been the question which we first disposed of, and the attention of the Court was not directed to the authorities which we have had the advantage of hearing elaborately discussed by Sir Fitzroy Kelly and Mr. Lush. After much consideration we are satisfied that the claim of the Crown upon this point also is well founded.

As to the first point of the question—whether the two grants of administration were necessary in order to complete the title of the claimant, it is only necessary to bear in mind the nature of such a grant as the act of a Court of sole jurisdiction pronouncing as to personal property to the exclusion of all other Courts,* upon the question of testacy and intestacy, and upon the right to receive and distribute the effects of the deceased in the event of intestacy, whether total or partial. Without the constat of such a Court no other Court can take notice of the rights of representations to personal property, and when such Court has by the grant of probate or letters of administration established the right, no other Court can permit it to be gainsayed.

Now, first, with respect to the grant of administration to the estate of the wife, it has not been contended that such grant is unnecessary or inoperative. It is necessary and it is operative because of the peculiar character of the right which a surviving husband has in the property of his deceased wife, not reduced into possession and not held by her as his agent, but retaining the character of a debt to her. The right to the latter differs from the title to the existing personal chattels of his wife which were his by the general rule in his marital right. These he may take and enjoy in such right without administration. That right, however, does not directly extend to a claim of the wife only in the nature of a debt, such as that of Isabel Cook in the present case. This, unless reduced into possession during coverture, he can only assert as her representative, and that as a consequence of the peculiar right recognised and preserved by the statute of distribution, for the husband to take out administration to his deceased wife for his own benefit, adversely to the next of kin.† To use the words of Williams on Executors (p. 782., 5th ed.), speaking of similar rights, "they do not belong to "the surviving husband *jure mariti* ; they will go to him as his wife's ad- "ministrator." It follows that as he could only enforce his rights in this respect as administrator of his wife, so his representatives can be in no better position, and the administration to her must therefore be considered as necessary.

Next, with respect to the grant of administration to the husband—is that necessary ? To determine this we must consider the principle upon which the representatives of the husband are substituted for him as entitled to his part of the estate of the deceased wife. As the surviving husband is entitled to letters of administration to his wife, and to reduce such property not reduced into possession during his coverture, into possession as her administrator, but for his own benefit, so it has further long been established that the accident of his death before he has so reduced the property into possession shall not affect the title thereto, but the representatives of the wife shall hold the property in trust for the representatives of the husband—*Elliot* v. *Collier*,‡ *Betts* v.

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* Barrs *v.* Jackson, 1 Phil. 582. † 1 Wms. Exors. 357, 358, 5th Ed.
‡ 3 Atk. 526.

Kimpton,* *Proudley* v. *Fielder*.† And acting in accordance with this doctrine, the Courts of Probate have in later times taken the course which was adopted in the present case, namely granted administration of the estate of the wife to the representatives of the husband as such; *Fielder* v. *Hanger*;‡ *Re Ann Sowerby*.§

All this so far from proving that the grant of administration to the wife is alone necessary, or that the grant to the husband is a form that might be dispensed with, establishes, on the contrary, that administration to the husband is also essential, for upon the principle already stated, without which Courts of Probate would be a useless incumbrance, the right to represent the husband must be established by such Court and by letters of administration being granted, before it can appear who, as representative of the husband, is also entitled as such to be the representative of the wife, or for whom, if the representative of the wife has already been granted, such representative is a trustee.

Lord Brougham, indeed, is supposed in one case—*Gutteridge* v. *Stilwell*‖—to have acted inconsistently with this doctrine, but we can only treat that decision as one affecting the practice of the Court of Chancery, and, even so regarded, it must be read with its correction by Lord Cottenham in *Loy* v. *Duckett*.¶

If, then, the two grants are necessary, is each to be charged with a stamp duty calculated upon the property to which they both relate?

As to the letters of administration to the wife's estate, it is not denied that stamp duty is chargeable. Nor could it be, because they are letters "for or in respect" of the property, and the case does not fall within the exception in the Schedule, because she was not a trustee for any other person or persons. Duty has therefore properly been charged in respect of this grant.

So in respect of the letters of administration to the estate of the husband, the stamp duty is equally chargeable. As they are necessary to establish the devolution of the property upon James Cook, and to entitle him to receive it, they are, in the words and within the spirit of the Act, "for or in respect" of that property, and are therefore properly, by the express terms of the Schedule, chargeable with a stamp duty upon the value of that property.

It was argued that nothing passed by such letters, all interest in the property having passed by the letters of administration to the wife. This, however, is a fallacy, because to get the benefit of the beneficial right of the husband's representatives such grant was necessary, and that beneficial right was not affected by the grant of administration to the wife's estate, and its value was the value of the property obtained "in respect" thereof.

Reference was made to the case of trust estates, and a supposed analogy alleged to exist, but this is inconsistent with the language of the Act, Schedule 3, by which trust estates are exempted only in the case where the deceased person held as trustee, which is not true as to either the husband or the wife in the present case.

It is said that there are two grants, but only of one estate. This also is a fallacy, for each grant is in respect of a distinct devolution. This will appear more distinctly in supposing the case of a claim by the child of the husband by another marriage, when in no sense could the claimant be said to represent the wife, yet such a claim would stand upon precisely the same footing as that of James Cook in the actual

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* 2 B. and Ad. 273. † 2 Myl. and K. 57. ‡ 3 Hagg. Eccl. Rep. 769.
§ 2 Curt. 852. ‖ 1 Myl. and K. 486. ¶ Cr. and Ph. 312.

case. His right is as representative of his father, and it is neither better nor worse, because if his father had not survived his mother he might have claimed as her representative. Two devolutions must be certified by the Probate Court, the second of which may or may not be of a person naturally representing the first intestate, and in respect of each such certificate, stamp duty is payable upon the property, and none the less because of its identity.

Nor is any injustice done by this course, but rather injustice is prevented, viz., that of depriving the Crown by reason of the laches of others, of duties upon two successions.

If the father had enforced his claim, he would in the ordinary course of things have obtained administration to his wife, and so possessed himself of the property, paying the duty upon that succession, and at his death his son, in order to obtain such property for himself, must in like manner have taken administration to his father, paying the duty upon that succession.

Upon this latter point the case of *Attorney General* v. *Malkin** is an authority in support of our conclusion.

The result is, that the judgment of the Court of Exchequer, in so far as it was in favour of the Attorney General, must be affirmed, and in so far as it was against the Attorney General must be reversed, and judgment given for the Attorney General.

Judgment accordingly.

SUCCESSION DUTY.

COURT OF EXCHEQUER, June 1864.

In Re the Estate and Effects of Domingo Capdevielle, deceased.

A testator, born at Montory in France, of French parents, in the year 1807, *went to Cadiz, where he was clerk to a merchant. He afterwards went to Gibraltar. In the year* 1830 *he came to England, and carried on business as a commission agent at Manchester until his death in* 1859. *During all that time he resided in lodgings at a weekly rent, paying also a weekly sum for his board. In* 1835 *he visited Montory, and again in* 1846, *when he passed a solemn act before a notary for the preservation of his co-hereditary rights of succession to a property there.*

He also then purchased a house and land at Montory, and desired that some apartments in the house should be kept ready for his return. He frequently expressed an intention to return to his native country. He devised all his real and personal property to his nephew in England. He had no real property in England, but a large amount of personalty, consisting chiefly of cash and railway shares.

Held,—*First, that the Testator was domiciled in France, and therefore his personal property was not liable to legacy duty; per* Martin *and* Channell, *B.B.*, Bramwell *B., dubitante. Per* Pollock, *C.B.—That whether or not the Testator retained his domicile of*

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* 2 Phillips, 64.

origin, he acquired a domicile in England for the purposes of commerce.

Secondly,—*That although the personal property was not liable to legacy duty, it was liable to succession duty; per* Martin *and* Channell, *B.B.* Pollock, *C.B., and* Bramwell *B. dubitantibus.*

JUDGMENT.

Martin B.—The judgment which I am about to deliver is that of my brother Channell and myself. There are two questions in this case; first, was the testator, Domingo Capdevielle, domiciled in England? This is a question of fact to be determined upon affidavits, which have been produced by the executor, and which I think we are bound to consider as substantially true; we have no reason to suppose they are otherwise. They state that the testator was born in France, and left that country prior to the year 1807 or 1808 to avoid the conscription. He first went to Spain, from thence to Gibraltar, and in 1830 came to England, and commenced the business of a commission agent at Manchester, and continued it until the 6th January 1859, when he died. He was twice in France during that period, and purchased some real property there. I think it is the true and fair inference from the affidavits that during the whole time his mind and intention was to return to France and die there, although he never determined or fixed upon any period when his return should take place, and that he was living in Manchester with the intention of remaining there for an indefinite period; but during all the time he had the hope and expectation and intention of returning to France and there ending his life; and that he always deemed and considered himself to be a Frenchman, and not an Englishman.

The question whether he was domiciled in England depends upon what is the true definition of domicile in regard to testamentary Acts. In Story's Conflict of Laws, c. 3. s. 46, it is said that "if a person has "actually removed to another place with an intention of remaining "there for an indefinite time and as a place of fixed present domicile "it is to be deemed his place of domicile, notwithstanding he may "entertain a floating intention to return (to his native country) at "some future period." If this be the true definition of domicile the testator was domiciled in England, for he had removed to Manchester and lived there for 29 years; his intention was to remain there for an indefinite time as his fixed permanent domicile, and although I believe he had always what may be called a floating intention to return to France at a future period, yet this, according to the above definition, would not prevent the English domicile. There are also two other definitions of domicile, one in the same work, c. 3. s. 43., viz., "that "place is properly the domicile of a person in which his habitation is "fixed without any present intention of removing therefrom;" the other is in Dr. Phillimore's Book on Domicile, c. 2. s. 15. p. 13, viz., "a "residence at a particular place, accompanied with positive or pre-"sumptive proof of an intention to remain there for an unlimited "time." If these be correct the domicile of the testator was English, but, on the other hand, there is a definition of domicile by Lord Wensleydale in *Aikman* v. *Aikman*,* which, if correct, seems to me to establish that the domicile of the testator was French, it is this, "every man's "domicile of origin must be presumed to continue until he has acquired

* 3 Macq. 877.

" another sole domicile by actual residence with the intention of " abandoning his domicile of origin. This change must be *animo et* " *facto*, and the burthen of proof unquestionably lies upon the party " who asserts the change." Now if this be the correct definition of domicile, the testator's domicile was French, for I think the undoubted inference from the affidavits is that he never had the intention of abandoning his French domicile, on the contrary, he always desired to retain it; and it may be predicated with absolute certainty that the Attorney General did not establish the contrary. But it was said that Lord Wensleydale was not to be understood as intending what his words seem to express, but it is to me clear, from the case of *Moorhouse* v. *Lord*,* decided last year, that Lord Wensleydale was understood by the noble and learned Lords who delivered judgment there in the sense which his words naturally mean. The three Lords who delivered judgment, Lord Cranworth, Lord Chelmsford and Lord Kingsdown, all go into the question of domicile. Lord Cranworth clearly intimates that the old view as to domicile was not correct, and that modern improved views existed. He says,† in order to acquire a new domicile, &c., a man must intend "*quatenus in illo exuere patriam.*" It is not enough if you take a house in another place, and that it is tolerably certain that you had better remain there all the days of your life. That does not signify; you do not lose your domicile of origin merely because you go to some other place that suits you better, unless you mean to cease to be a Scotchman, and become an Englishman, or a Frenchman, or a German. In that case, if you give up everything you left behind you, and establish yourself elsewhere, you may change your domicile. It is therefore clear to my mind that Lord Cranworth entertained the view as to domicile which the words of Lord Wensleydale naturally and in their ordinary meaning impart. Lord Chelmsford is, if possible, still more clear. After stating that two definitions of domicile which had been mentioned were in his opinion liable to exception, he proceeds; " The present intention of making a place a person's permanent home " can exist only where he has no other idea than to continue there, " without looking forward to any event, certain or uncertain, which " might induce him to change his residence. If he has in his contempla- " tion some event upon the happening of which his residence will cease, " it is not correct to call this even a present intention of making it a " permanent home. It is rather a present intention of making it a " temporary home, though for a period indefinite and contingent. " And even if such residence should continue for years, the same " intention to terminate it being continually present to the mind, there " is no moment of time at which it can be predicated that there has " been the deliberate choice of a permanent home. In a question of " change of domicile, the attention must not be too closely confined to the " nature and character of the residence by which the new domicile is " supposed to have been acquired. It may possibly be of such a " description as to show an intention to abandon the former domicile, " but that intention must be clearly and unequivocally proved." He then clearly adopts Lord Wensleydale's definition, as I understand it, and states it at length. Lord Kingsdown expressed his concurrence with the other judgments and added: " Upon the question of domicile I " would only wish to say that I apprehend that change of residence " alone, however long and continued, does not effect a change of " domicile as regulating the testamentary acts of the individual. It may

* 10 House of Lords Cases, 272. † Id. 283.

" be, and it is, a necessary ingredient; it may be, and it is, strong evi-
" dence of an intention to chaneg the domicile, but unless, in addition
" to residence, there is *intention to change the domicile*, in my opinion
" no change of domicile is made." I adopt the definition of Lord Wensleydale. I think it is approved of by the three noble and learned Lords whose opinions I have quoted, and as I think there is no evidence of intention of the testator to change his domicile, in my judgment the domicile of the testator was French.

The other point is, whether, assuming the domicile to be French, succession duty is payable. The argument on behalf of the executor is very clear, and apparently cogent. The duty is claimed in respect of a legacy of personalty, the testator is to be taken as having a French domicile. The rule of law is, that "*mobilia et personalia sequunter personam.*" It is said, therefore, to be the same as if the will had been made by a Frenchman who had never been out of France in his life, and all his personalty had been locally situated there. The House of Lords, in *Thomson* v. *The Advocate General*,* acted upon this principle, and have conclusively decided that legacy duty is not payable in respect of the present bequest; and there is certainly no expression to be found in the Succession Duty Act to show an intention to alter the law. The House of Lords there put a limitation upon the words "every legacy given by any will of any person" and we are urged to put the same limitation upon the words "every disposition" in the second section of the Succession Duty Act.

On the other hand, the case of *Wallop's Trust*,† decided by the Lord Justices on the 11th March in the present year, was cited by the Attorney General. It was the case of an appointment by will of personalty by the donee of a power domiciled in Jersey, the power being created by the will of a testator domiciled in England. The Lords Justices held succession duty to be payable. It was said that this case was not in point, inasmuch as the legacy was under a power and took effect by virtue of the will of a testator who was domiciled in England. Lord Justice Turner, however, stated in the most express and direct terms that this was not the ground of his judgment, and that in his opinion the legatees of persons domiciled out of Great Britain, and the appointees of donees of powers so domiciled, were intended to be and were subject to succession duty by the second section of the Act.

This case is in substance in point, and I think we ought to be bound by it; and if it be wrong it ought to be set right by a Court of Appeal, and not by one of co-ordinate jurisdiction.

Bramwell, B.—I agree that the Crown is entitled to duty. With respect to the first point, I cannot say that I dissent from the reasons given by my brothers Martin and Channell for their judgment, because I am unable to form an opinion on the subject to which I can attach any value, and therefore I am disposed to subscribe to that expressed by Judges whose opinions I so much respect. I wish, however, to state the reason of my difficulty.

Here a question arises on an English Act of Parliament, whether certain personal property is liable to legacy duty, and that depends on whether or no the testator was domiciled in England. I concur with my brother Martin in his appreciation of the facts with reference to the question involved. The word "domicile" is not to be found in the statute, but if by authoritative decision its operation is limited to cases where a testator was domiciled in England, no doubt our duty is

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* 12 Cl. and F. 1. † 1 De Gex., Jones and Smith, 656.

simply to ascertain whether or no there has been an English domicile. To my mind that must always be a matter of great uncertainty, on account of the extreme difficulty in saying what constitutes an English domicile. Every definition, except one, of the word "domicile" would comprehend this case, and render the testator domiciled in England, and all the authorities relating to Anglo-Indian domicile point in the same direction. The only authority to the contrary is the decision of the House of Lords in *Moorhouse* v. *Lord*. No doubt the judgments pronounced by the noble and learned lords in that case, and the expressions of Lord Wensleydale in *Aikman* v. *Aikman*, tend to show that the testator had not acquired an English domicile, because, according to my appreciation of the facts, he always had the intention, hope, and expectation of returning to France, and perhaps of there ending his days. If I felt satisfied that this case was concluded by the decision of the House of Lords in *Moorhouse* v. *Lord*, of course I should trouble myself with no further reasoning about it, but follow, as I am bound to do, that decision. But in my opinion there are two difficulties in reference to it. One is, that it is inconsistent with the former cases respecting Anglo-Indian domicile, and yet it does not expressly overrule them, or even notice them. The other is, that the expressions used appear to me, with great deference, far too extensive. To say that a a man cannot abandon his domicile of origin without doing all that in him lies to divest himself of his country, is a proposition which, with great submission, I think cannot be maintained. In the ordinary case of an Irish or English labourer, emigrating to the United States of America, without any hope or intention of ever returning, but not naturalizing himself, for fear of being subject to conscription; ready to claim the protection of the British Ambassador to prevent his being made a conscript, but having no desire or intention whatever to remain a British subject; I think that, if he died in America, it could scarcely be argued, that America was not his place of domicile, although he had not done all that in him lay to abandon his native country. Therefore, assuming those noble and learned lords intended to overrule previous cases, I have great difficulty in supposing that they intended everything which would be comprehended within the very extensive expressions they used.

That being so, I cannot help referring to the Act of Parliament; and, as I before observed, the word "domicile" is not found in it. The Act imposes a duty on *every legacy*, but the general words of the Act must be restricted to that which is properly the subject of a British legacy, that is to say, British personal property, and cannot apply to a foreigner, or an Englishman in the position of a foreigner, that is, domiciled abroad. I am content to suppose the rule of law reasonable, that personal property having no *situs* follows the domicile of its owner. But here is the case of a Frenchman who left his native country more than half a century ago, and who lived for nearly 30 years in England, where he attained an old age, whose place of business was in England, who made his property in England, and invested the greater part of it there, who made a will in England, which required probate in a Court in England, and who left property to a legatee residing there. Then why should not that property be subject to legacy duty, the legatee being in England and taking the property here under English authority? I own I cannot see why it should not; and, acting on my own unassisted judgment, I should have been unable to come to the conclusion that the property was not subject to legacy duty because the testator was a Frenchman, and ought to be treated in the same way as a person who had never been

in England and had no property here. I have considerable difficulty, either looking at the reason of the thing, or in the belief that the Anglo-Indian cases are over-ruled; whilst, on the other hand, I have a difficulty the other way, on account of the extensive expressions used by the noble and learned lords in *Moorhouse* v. *Lord.*

But then it is said that if the property is not liable to legacy duty it is liable to succession duty; and cases have been cited in support of that position. Although I have great faith in, and respect for, the authority of the learned Lord Justice who pronounced an opinion in accordance with that view (which was certainly not heartily concurred in by his learned coadjutor), I confess I have great difficulty in following that authority, for this reason, that whatever arguments can be used for the purpose of showing that legacy duty is restricted to persons and property the subject of British legislation, so as to exonerate persons in a case like this, are equally applicable to succession duty, and the Succession Duty Act equally requires some limitation in its application as the Legacy Duty Acts; because to my mind everything that is true of the one is equally true of the other. There is the same difficulty in applying the Succession Duty Act to *all* persons *everywhere*, whether domiciled in England or not, as there is in the case of the Legacy Duty Acts; and I cannot see why the same reasoning should not apply to the one as the other. I say most unfeignedly, though I have thought it right to give expression to the doubt I entertain, I feel myself so embarrassed in forming an opinion, that while I certainly agree in the conclusion at which my brothers Martin and Channell have arrived, I cannot say I differ even in the reasons they have given for it.

Pollock, C.B. said, I agree that the Crown is entitled to duty; but the grounds of my decision are not the same as those stated by the other members of the Court. I think that the argument of the Attorney General is well founded, and he established to my satisfaction that if the question now arose for the first time we should not be wrong in deciding that the testator, a Frenchman who had resided in England a considerable number of years and amassed his property here, was domiciled in England; and therefore on his death his property was liable to be distributed according to the law of England, and was subject to legacy duty. I am not satisfied, however, that such a decision would be in accordance with some recent authorities. Nevertheless, I entertain a very clear view of the grounds on which my opinion is founded, and in the result concur with the other members of the Court. I own that if I were to express all the doubts to which this question gives rise, I should require considerable time to state them at length.

The question of domicile is a very large one, and it is not easy to ascertain affirmatively all that belongs to it, particularly when applied to English law. It is somewhat remarkable that "domicile" is now very frequently the subject of discussion in our Courts, and, as we have more than once observed, the word is comparatively entirely new to the English law, for neither it nor the notion it conveys belongs to anything English. The word "domicile" is not to be found in Viner's Abridgment, Bacon's Abridgment, Comyn's Digest, or in English law books from Bracton down to Blackstone. An English subject is domiciled in every part of England; but that is not so in foreign countries where the law of domicile prevails. There a man is domiciled at the particular part of the dominions where he was born, and there are certain acts which he cannot perform unless at his place of domicile. The English law knows no such disability. A British subject may marry or make a will in any part of the British dominions.

I think that for certain purposes a person may have more than one place of domicile. I apprehend that a peer of England, who is also a peer of Scotland and has estates in both countries, who comes to Parliament to discharge a public duty, and returns to Scotland to enjoy the country, is domiciled both in England and Scotland. A lawyer of the greatest eminence, formerly a member of this Court, and now a member of the House of Lords, to whose opinion, I in common with all the profession, attach the highest importance, once admitted to me that for some purposes a man might have a domicile both in Scotland and England. I cannot understand why he should not. Then why may not the same thing occur with reference to commerce, manufactures, or any other purpose? Suppose, for instance, a person born in England of French parents (and therefore a French subject, with an English domicile of origin,) had a large commercial establishment in both countries, without any particular attachment to either, but only intending to make the most money he could in both; why should he not, for the purposes of the particular establishment, be domiciled in both countries, so that his property in England would be administered according to the law of England, and his property in France according to the law of France? But somehow or other a notion has crept in that, although there may be three sorts of domicile, as in France, there can be only one for the purpose of administering property in England. I cannot conceive what reason or necessity there is for any such distinction, and in the case which I have put, I cannot understand why a person, for the purpose of commerce and manufacture, should not have a domicile both in England and France.

Now, the conclusion to which the authorities lead is, that the testator was domiciled in England. Where British subjects have settled in the East Indies and there realized a large personal property, it has been considered exempt from legacy duty because they have acquired what is called an Anglo-Indian domicile. But there can be no doubt that in every one of those cases the party intended to return to this country, and here spend the remainder of his days. I very much doubt whether the noble and learned lords who, in the case of *Moorhouse* v. *Lord*, expressed the opinions which have been adverted to, intended to say that the decisions with respect to Anglo-Indian domicile were wrong. The argument of the Attorney General has satisfied me that the testator acquired an English domicile; at the same time I think that my learned brothers are correct in saying that the opinions expressed by the noble and learned Lords who decided the case of *Moorhouse* v. *Lord* are calculated to convey the notion that the definition of Mr. Justice Story* is not correct, and that a new definition of domicile may be given and acted upon in this country. However, a judgment of the House of Lords is only binding so far as it necessarily determines some certain proposition; it is not binding as to the reasons given by each of the noble lords, even though they should all concur in giving the same. If, indeed, the reasons for a judgment are so interwoven with the decision as to form a necessary part of it, no doubt it is an authority which no one ought to treat lightly, and to which every Judge ought to defer if he can; but he is not bound to do so, though he is undoubtedly bound by the judgment, or what may be called its essence and principle. In the case of *Moorhouse* v. *Lord*, I should have come to precisely the same conclusion as the noble and learned lords who decided it, without thinking it necessary to give a new definition, or to enunciate any doctrine

* Story's Conflict of Laws, s. 43, p. 53.

to be regarded as a new and improved view of the law of domicile, as if Mr. Justice Story was no authority, and all the antecedent writers on the subject wrong ; I own I am not of that opinion. In my judgment, the definition of Mr. Justice Story is for all practicable purposes far more reasonable than any other that I am aware of. Seeing that the definition given in *Moorhouse* v. *Lord* was not necessary for the decision of that case, I am not disposed to adopt it in this. I am rather disposed to adopt the argument of the Attorney General, and agree with him that the testator was domiciled in England, and therefore his personal property is liable to legacy duty.

But it was further argued on the part of the Crown, that assuming the testator was domiciled in France, and his property exempt from legacy duty, the case of *In re Wallop's Trust* is an authority that it is liable to succession duty ; I think that the opinions of the learned Judges of the Court of Appeal in Chancery are entitled to the greatest respect, but that Court is not, in matters of revenue, a Court of co-ordinate jurisdiction with this Court. I own that if in this case there had been a French domicile, I should have entertained considerable doubt whether the property was liable to succession duty. But I so far respect the opinions of the learned Judges who decided Wallop's case that I should be disposed to adopt their view But whether we take, one view or the other, according to the decision of the Lords Justices, the Crown is entitled to duty ; and if the Attorney General is right in saying that the domicile was English, which I think is really the correct view, there can be no doubt on the subject. I therefore agree with the rest of the Court that the Crown is entitled to duty ; at the same time I have thought it right to make these remarks, because there are principles involved in our decision which I think by no means free from doubt.

Cause shown for non-delivery of the account and non-payment of the duty and costs, disallowed, and order for payment of the duty and costs.

SUCCESSION DUTY.

COURT OF EXCHEQUER, June 1864.

The Attorney General *v.* Lord Lilford.

In September 1860, *Thomas Atherton, Lord Lilford, the father of the defendant, became beneficially entitled to certain real property as tenant in tail in possession, and in November following he executed a disentailing deed, limiting the property to himself in fee. He died in March* 1861, *before any of the eight half-yearly instalments of succession duty became due, having by his will bequeathed the property to the defendant for life.*

Held, *that as the defendant's father was competent to dispose by will of a continuing interest in such property by the* 21*st section of the Succession Duty Act, the instalments unpaid at his death were a continuing charge on such interest, and payable by the defendant as owner of it for the time being. Per* Martin, Bramwell, *and* Channell, *B. B.; Dissentiente,* Pollock, *C. B.*

JUDGMENT.

Martin B.—The judgment which I am about to deliver is that of my Brother Channell and myself.

In September 1860 the late Lord Lilford became entitled as tenant in tail in possession to certain real property, and became chargeable to succession duty. In November of the same year he executed a disentailing deed, and limited the property to himself in fee. He died in March 1861, having by his will devised the property to the defendant for life, who is now in possession of it. At the time of his death none of the eight half-yearly instalments of duty payable in respect of his succession had become payable. The defendant has refused to pay them, and this information has been brought to compel payment; the Attorney General insisting that they were a continuing charge on the testator's interest at the time of his death, and payable by the defendant as owner for the time being of such interest. We think the Attorney General is entitled to judgment.

The question depends upon the true construction of the 21st section of the Succession Duty Act, 16 & 17 Vict. c. 51. By the 42nd section the duty is declared to be a first charge on the interest of the successor and of all persons claiming in his right; and by the 21st section, the interest of the successor in real property shall be considered to be of the value of an annuity equal to the annual value of such property, to be valued according to the table in the schedule, and the duty chargeable thereon (that is, on the interest of the successor) shall be paid by eight half-yearly instalments; but there is a proviso, that if the successor shall die before the instalments shall become due, the instalments not due at his decease shall cease to be payable, except in the case of a successor who shall have been competent to dispose by will of a continuing interest in such property. The word "property" in the section means the thing, that is, the land or hereditaments in respect of which the duty is charged. This is clear, as well from the 21st section itself as the interpretation clause, and not only was the late Lord Lilford competent to dispose by will of a continuing interest in the property, but he actually did so, and the defendant was the object of his bounty. We think that this brings the case within the exception engrafted on the proviso, and the consequence follows, as declared in the section, viz., "that the instalments unpaid at his death were and are a continuing charge upon his interest, and are payable by the defendant, who for the time being is the owner of such interest."

It was argued that the defendant was by such construction compelled to pay two succession duties, one his own, the other the testator's. This is a fallacy; he is liable, of course, to pay his own succession duty, properly so called; but what he is now required to pay is a charge or debt of a testator who was the owner in fee simple of the land devised to him, and we think that not merely does the 21st section of the statute impose the liability, but that reason and good sense and the spirit of the act concur. The testator was liable to the duty. Had he been merely tenant for life, and died within the four years, the instalments unpaid would have ceased to be payable, but he was owner in fee, and why should not his fee simple interest be liable to his debts? Cases were put of a tenant for life and a tenant for years purchasing the reversion in fee. We do not think there would be any very great difficulty in arriving at a correct conclusion in such cases, but for the present it is sufficient to say that

this case is a devise by will by an owner of a fee simple acquired by his own act.

Bramwell, B.—In this case it is clear that, but for the latter part of section 21, the duty claimed would be due—due from the deceased Lord Lilford, and payable at least out of his assets. The question then is, if that part of the section causes it not to be due, or if due not a charge on the present defendant or the estate he has taken. Now it is not easy to understand the reason of the enactment in question. The statute has imposed a duty on successions, or on real property on successions to it. It has, therefore, very fairly and reasonably taken each successor's interest to be taxed as not greater than a life interest, because on his death there is another taxable succession. If land is devised to A for life, on his death it is subject to a fresh succession duty, so it is if it is devised to him in fee. Then, to estimate what shall be paid, the value of his interest is taken to be the value of an annuity equal to the annual value of the property for his life. It is then assessed and found for better or worse, but for his convenience it is made payable by instalments. This being the principle on which the Legislature has proceeded, it is difficult to see why the successor to a life estate is relieved from unpaid instalments if he dies before they are due, but not so the successor to a fee. Nor is it easy to see why, if either successor lives four years and a half, he pays all the instalments without return, and no more if he lives fifty years, but has an abatement if he lives under four and a half years. Further, the language of the exception to the proviso is remarkable. It means, I suppose, to say, first, that the instalments shall be payable; secondly, that they shall be a continuing charge on the successor's interest; thirdly, that his other property is to be exonerated; fourthly, that the owner of the land shall pay the duty. The first is enacted by implication only; whether the last proviso exonerates the first successor's executors may be a question, or if it makes the next successor liable beyond his interest; so what would be comprehended by the words "a continuing interest" may be doubtful. However, there is the enactment, and it seems to me clear that whatever the proviso may free, the exception to that proviso makes the owner of the property in respect of which the succession duty was due liable for it, at least to the extent of his interest, when the first successor "shall have been competent to dispose by will of a continuing interest in such property."

The question then is, was the defendant's father so competent? I agree with the Attorney General that this particular case must be decided; that difficult cases may be suggested which must be met as they arise. Now I think Lord Lilford was so competent; in fact, he did it. He did dispose by will of a continuing interest. No doubt a preliminary step, the disentailing deed, was necessary, but that step was also in his competency depending solely on his pleasure whether or no it should be taken. In *Lord Saltoun* v. *The Advocate General*,* Lord Campbell said, and justly, that this statute being applicable to the whole kingdom, the technicalities of the laws of England and Scotland, where they differed, must be disregarded, and the language of the Legislature must be taken in a popular sense. And can it be doubted that in popular language Lord Lilford was competent to dispose by will of a continuing interest in this property? Again, in Lord Braybrook's case, the House of Lords held that the estate tail, though technically ended upon a resettlement of the estates, in reality, for the purposes of the succession duty, continues. See per *Lord Kingsdown*,†

* 3 Macq. 671. † Lord Braybrooke *v.* Attorney General, 9 House of Lords Cases, 181.

and see *Attorney General* v. *Floyer*.* For these reasons and on these authorities I think the Crown entitled to judgment.

Pollock, C.B.—I regret very much that I am unable to come to the same conclusion as my learned brothers, and the rather because the claim of the Crown seems very reasonable, inasmuch as the difference between an estate tail and an estate in fee seems to be (for the purpose of this question) scarcely more than technical, and not only is the claim of the Crown reasonable, but the language of the 21st section (upon the true construction of which the judgment of the Court ought to depend), certainly, without doing any violence to it, may fairly be read so as to support the claim.

But in construing the 21st section of the Act, we are bound to look, not merely at the case before us, but at other cases which may arise, and (assuming the construction to be doubtful) to put such a construction as will be uniform and consistent with reference to all the cases that may come before us for decision.

The claim of the Crown is in amount and in time of payment precisely the same for a succession to an estate in fee simple, or to an estate tail, or an estate for life, and provided they all live according to the expectation of life, that is (unless the tenant in tail or tenant for life prematurely dies), they all pay exactly the same succession duty; the only difference between them is, that tenant for life and tenant in tail pay the instalments only which come due while they live, but in the event of the death of the tenant in fee before all the instalments are paid (the claim upon whom seems to have been considered as a debt due to the Crown whether he lived or died), the unpaid instalments continue to be a charge on the estate, not on his *property generally*, but on his interest in the estate which gave rise to the claim for succession duty. The difference between a tenant in tail and a tenant in fee is, however, not purely technical. The tenant in tail may, by executing a disentailing deed, acquire the fee absolutely, but then he must be of full age, or he cannot execute such a deed at all, and he must be in possession long enough for the preparation and execution of the deed; and supposing him to have executed such a deed, and to have thereby acquired the fee and become competent to dispose by will of a continuing interest in the property, is he, within the expression of the 21st section, "a successor who shall have *been* competent," &c., because he has undoubtedly *become* so.

Now, if in the case of *tenant in tail* (acquiring the fee by executing a disentailing deed,) we read the words of the 21st section as if they had been "shall have been competent *or shall have become competent*," in other words, if we construe the 21st section so as to include a successor who, after the succession, becomes competent to dispose by will of a continuing interest, we must construe it in the same way in *all* cases, and we must construe it in the same way if the successor was merely tenant for life, the remainder going to some other person, and the tenant for life acquiring the remainder by purchase or under the will of the person entitled to it. Referring to these and similar cases which might be put, I think the reasonable and true construction of the whole Act is, that with respect to a particular succession the *liability of the successor* and the *claim of the Crown* are *fixed* and *settled* by the *state of things existing at the time the succession takes place*, and cannot be altered by the subsequent acts of the successor himself, or of any other person.

I do not know what would have been the opinion of my learned brothers in the case of tenant for life acquiring the fee by purchasing

* 9 House of Lords Cases, 477.

the remainder, or by its being devised to him, or by its descending upon him in consequence of the death of intermediate heirs. In the latter case there would be some apparent ground for contending that the charge should be continuing, otherwise he would succeed to a remainder for which he would pay no succession duty. But the explanation of this is that, by the 21st section, the interest is to be valued according to certain tables and by certain rules, which make the value of a remainder after a man's own life worth nothing at all. Now I think it is clear that the words in the 21st section, viz., "a successor who shall have been competent to dispose by will of a continuing interest," &c., may mean (as no time is mentioned) either at the time when he *became successor* or at *any subsequent time.* The latter mode of construing the words gives to them the same effect as if the language had been "who shall have been competent, or who shall have (subsequently to the succession) *become* competent," &c., and if these words had been used there could have been no doubt our judgment must have been for the Crown. The former mode gives to the language the same effect as if it had been "except in the case of a successor who shall have been (at the time of his becoming successor) competent," &c., and had these words been used there would have been no doubt the other way, and our judgment must have been for the defendant. If the inquiry be which of these interpolations is the least violent, I own I should decide in favour of *the latter;* but I think a successor is spoken of with reference to the precise time when he *became successor,* and not to the subsequent period after he has actually succeeded, and in one sense may be said to have ceased to be a successor; and I think a uniform, consistent, and just construction of the words of the 21st section would lead to a judgment for the defendant, but as a majority of the Court is of a different opinion, the judgment must be for the Crown.

Judgment for the Crown.

PROBATE DUTY.

COURT OF EXCHEQUER, June 1864.

Percival and others, Suppliants, *v.* The Queen.

The words "debts due and owing from the deceased "and payable by law out of his or her personal or "moveable estate" in the Act 5 & 6 Vict. c. 72. s. 23., which authorizes a return of excess of probate duty, mean such debts as of themselves and in their own nature and character are payable out of the personal estate, and have no reference to any provision which a testator may make in his will for their payment.

Therefore, where a testator devised all his real and personal estate to his executors, upon trust to sell it, and out of the proceeds pay his funeral and testamentary expenses, debts, and legacies, and invest the residue in their names for the benefit of his relations, and the executors did not sell the real estate, but paid simple contract debts out of the personal estate to such an amount that its value was reduced to a sum which, if it had been the whole gross amount or

value of the estate would have occasioned less stamp duty to be paid on the probate;

Held, *that the executors were entitled to a return of the excess, and were not bound to apportion the debts* pro rata *over the personal estate and real estate according to their respective values.*

JUDGMENT.

Delivered by Martin, B.—The testator by will dated in August 1856 devised all his real and personal estate to his executors, upon trust to sell, and directed that out of the proceeds they should pay his funeral and testamentary expenses *and debts,* and several legacies, and invest the residue for the benefit of relations.

The will was proved, and the personal estate was of a value upwards of 20,000*l.* and under 25,000*l.*, that is to say 23,664*l.* 1*s.* 9*d.* The real estate has not been sold, but it is valued at 12,312*l.* 2*s.* 7*d.* The executors have paid the simple contract debts payable out of the personal and moveable estate to the amount of 12,473*l.* 2*s.* 11*d.*, exclusive of mortgage debts to the amount of 554*l.* 10*s.*, which they have also paid. Other mortgage debts to a considerable amount are still unpaid.

The executors have required the Commissioners of Inland Revenue to return to them a difference of duty amounting to 150*l.*, alleging that they are entitled to deduct the simple contract debts from the value of the personalty, and, if they be right, they are entitled to this sum. Upon the other hand, the Commissioners contend that, under the circumstances, the difference should be apportioned according to the value of the personalty and realty, and such sum only returned as would be the proportion applicable to the personalty, and if they are right, 100*l.*, which they have offered to return, would be enough.

The question depends upon the true construction of the 23rd section of the 5 & 6 Vict. c. 79. This section is, with two immaterial exceptions, a transcript of the 51st section of the Stamp Act, 55 Geo. 3. c. 184.

The argument of the Attorney General was that the will created a mixed general fund to be applied in payment of debts; and in such case the law, as administered in Courts of Equity (which no doubt is the law of the land), is that the personal and real estate must, when it becomes necessary to make a distinction, contribute to the debts in proportion to their respective values, and he cited *Roberts* v. *Walker** and *Simmons* v. *Rose*† in support of it. But the present case depends upon the true construction of the 38th section of 55 Geo. 3. c. 184., and the 23rd section of the 5 & 6 Vict. c. 79., and what they enact. The 38th section, in substance, directs that an affidavit shall be made that the personal estate, without deducting anything on account of debts due by the testator, is under the value of a certain sum (in the present case 25,000*l.*), in order that the proper stamp duty may be paid; and the 23rd section directs that when the executor shall *have paid debts due and owing from the testator and payable by law out of his personal or moveable estate* to such an amount as, being deducted from the value of the personal estate, in respect of which probate duty has been paid, would reduce the same to a sum in respect of which a lesser amount of probate duty would have been payable, the difference is to be returned.

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* 1 Russ. and Myl. 752. † 6 De. Gex., M. and G. 411.

The substance therefore is, that the probate duty ultimately payable shall be upon the value of the personal estate after deducting *the debts due and owing from the testator and payable by law out of the personal estate*, and the question is what, according to the true construction of the sections, are such debts.

We think the Attorney General established that if a Court of Equity had to administer an estate when the mixed fund was liable to the debts, and the personal representative was entitled to a residue of the personal estate, and the heir to a residue of the real estate, they would have apportioned the debts according to the value of the personal estate or real estate respectively, and thus ascertained the just residue belonging to each class of representatives.

In answer, it was urged that the present will was not one in which any such question as to residues could by possibility arise, that the executors had merely done what they were authorized by the will to do, and all that remained to be done was to distribute the residue amongst the parties entitled. Again, assuming the correctness of the rule as to administration stated by the Attorney General, it by no means followed that an apportionment of the difference of the probate duty should be made, which, it was argued, would practically cast probate duty upon real estate, which was contrary to law. And again, that the expression "debts payable by law out of the personal estate" means such debts as of themselves and in their own nature and character were payable out of the personal estate, and has no relation to any provision which the testator may make in the will for their payment. Why are the words debts "due from the testator and payable out of his personal estate" not to receive a natural construction? The Attorney General says a natural construction gives no meaning to the words "payable by law out of his personal estate," since all debts due from him are so payable. But then the Attorney General's construction gives no meaning to the words "by law." He reads the words "payable out of his personal estate" as meaning what his personal estate is to bear. Those words, to our minds, mean what the law, of its intrinsic force, would make payable out of the personal estate; whereas the construction contended for by leaving them out makes the sentence mean, "what, by the disposition of the testator, is to be paid out of the 'personalty.'" We think the true meaning of the enactment is that the executors are entitled to our judgment.

The statute 17 & 18 Vict. c. 113. was referred to, but it has no relation to this case. The 564*l.* 10*s.* paid for mortgage debts would not affect the difference to be returned, and the executors make no claim in respect of it.

There is a statement in the case which, as we understand it, is that since 1815 the Commissioners who manage the Stamp Duties have understood the enactment according to what we think is its true legal construction.

Judgment that the suppliants are entitled to payment of 150*l.* and costs.

LEGACY DUTY.

COURT OF EXCHEQUER, November 1864.

The Attorney General *v.* The Count and Countess Blucher de Wahlstatt.

The testatrix, an unmarried Englishwoman, on the death of her surviving parent in 1849, *went to reside with her married sister, the Countess Blucher, at Baden Baden, in Germany, and continued to reside there with her until* 1863, *when the testatrix died. On leaving England she discharged her English maid servant and engaged a German one, and she caused a library of books (which was the only moveable property belonging to her in England) to be sent to her abroad. She contributed towards the expenses of housekeeping, and often told her sister that if she were to survive her she should continue to live in Germany, and that nothing would induce her to return to England except on an occasional visit to one of her sisters. She named a churchyard near Baden where she wished to be buried. In March* 1854 *she made a will according to the law of the State of Baden. In May* 1854, *she came to England and made another will, in which she described herself as "now on a visit to my sister;" and she gave her property to trustees in trust for her sister, Countess Blucher, who, as sole executrix, proved the will in England. All her property was invested in English securities. Two years before her death an additional room was built to her sister's house at Baden for her accommodation.*

Held, *First, that assuming the testatrix intended to abandon her domicile of origin, there was no evidence that she acquired a new domicile, and therefore her domicile of origin continued, and her property was chargeable with legacy duty.*

Secondly, that if she had acquired a new domicile, her property would have been chargeable with succession duty.

JUDGMENT.

Pollock, C. B.—No doubt, adhering to the doctrine laid down in the recent case of *In Re Capdevielle*,* our judgment must at all events be for the Crown, on the ground that succession duty is payable; but we are all prepared to give judgment for the Crown on the other point, viz., that there is no sufficient evidence of an intention to change the domicile. If the testatrix had been asked whether she intended to abandon her domicile of origin, she would probably have answered, "I know nothing about the law of domicile. I have no intention of becoming a German. So long as my sister lives I mean to reside with her, but I cannot say whether if I should survive her and have relatives in England, I might not go back to my native country, but I should do so with great reluctance, for I prefer living in Germany." That is very different from an intention to change the domicile.

* 2 Hurlst and Nor. 985.

Mr. Coleridge has asked, "In what way is an unmarried English lady to change her domicile?" It is enough to say that what has been done in this case is not sufficient for that purpose.

With respect to some of the facts relied on, such as the testatrix discharging her English maid and taking a German maid into her service, and naming the churchyard near Baden Baden where she wished to be buried (which I think only meant if she died at that place), I cannot agree that they afford any satisfactory evidence of an intention to change the domicile, and in my opinion they are not calculated to produce any impression on an unprejudiced mind, especially with reference to an English lady who makes her will, and retains all her property in this country. If she intended to stay some time in Germany, it is very natural that she should send for her books; but by her will she left her property to English trustees, and to be administered according to English law. Under these circumstances, I am clearly of opinion that there is no sufficient evidence to justify the Court in coming to the conclusion that the testatrix meant to change her domicile. Our judgment will therefore be for the Crown.

Bramwell, B.—I am of the same opinion. It seems to me that there is no evidence of a change of domicile, for a domicile cannot be changed unless the domicile of origin is abandoned, and a new domicile acquired. In the case of *In Re Capdevielle* my brother Martin entertained some doubt whether the law as to what is necessary to be done in order to acquire a new domicile had been altered. But whether or not the language of Lord Cranworth in *Moorhouse* v. *Lord** is to be understood in its fullest extent, viz., that in order to acquire a new domicile a man must do all in his power to abandon his native country; and assuming that there was some evidence that the testatrix intended to abandon her domicile of origin, that is not enough, for her domicile of origin continued unless she acquired a new domicile elsewhere. Now, without making any captious criticism upon the word "Germany," and conceding that the testatrix intended not to live in England, and that the only place at which she meant to live was where her sister resided, after the death of her sister she would have to seek some new abode, possibly in Germany; but as she was personally attached to her sister, and not locally attached to any place, I think there was no acquisition of a new domicile, and consequently no loss of the domicile of origin.

Channell, B.—Considering that the counsel for the defendant have declined to address to us any argument upon the second point, and also that in the case of *In Re Capdevielle* my brother Martin and myself thought ourselves bound by the decision of the Lords Justices in the case of *In Re Wallop's Trust*,† I am of opinion that the Crown is entitled to judgment on that point; but as our decision may be reviewed in a Court of Error, it is manifestly convenient that each member of the Court should express his opinion upon the question of domicile.

I agree with the definition of domicil by Lord Wensleydale in *Aikman* v. *Aikman*,‡ which was approved of by Lord Cranworth, Lord Chelmsford, and Lord Kingsdown in *Moorhouse* v. *Lord*, and was adopted by two members of this Court in the case of *In Re Capdevielle*. I am therefore of opinion that the testatrix retained her domicile of origin. It is not necessary to repeat the facts or the explanation of them given by the Lord Chief Baron. I adopt the views expressed by my learned brothers; and I am unable to come

* 10 House of Lords Cases, 272. † 1 De Gex, J. and S., 656. ‡ 3 Macq. 854.

to the conclusion that the testatrix acquired a new domicile, so as to divest herself of her domicile of origin. Upon these grounds I concur in thinking that our judgment should be for the Crown.

Pigott, B.—I entirely agree with my learned brothers. I adopt Lord Wensleydale's definition of domicile in *Aikman* v. *Aikman*, and I think it must be presumed that every person retains his domicile of origin until he has acquired a new domicile ; and that the burthen of proof lies upon the party who asserts the change. Then comes the question whether we are satisfied with the defendant's proof of a new domicile.

No doubt there are some facts which tend to show an intention to change the domicile; for instance, the removal of the books to Germany. But that is an equivocal fact, for it might have been done after valuing the expense of removing them to Germany with that incurred by warehousing them in England. Again, a desire to read the books may have been the sole cause of removing them. So with respect to the expression in 1854 of a wish to be buried in a particular churchyard, it may be that the testatrix was very unwell at the time, and expected to die. As to that we know nothing beyond the bare words attributed to her. Then again, as to the declaration of the testatrix, much pressed on us, that if she survived her sister she should still continue to live in Germany, and that nothing would induce her to return to England except on occasional visits, we know nothing of the conversation but that part, and it may be that if we knew the whole, the subject discussed was whether, if her sister in Germany died, the testatrix would return and live with her sister in England, and she may have said "Nothing will induce me to return to England. I shall continue to live in Germany." Any slight addition to the conversation might give a different complexion to the language used, and alter the construction put upon it. Then, on the other hand, the circumstance of the testatrix coming to England and making a will according to the law of England, in which she described herself as on a visit to her sister, without saying whether permanently resident or having a domicile abroad, tends rather to show that she considered herself subject to the law of England, and found it requisite to make an English will in order to pass her property. It is, however, enough to say that I am by no means satisfied, upon the evidence, that she had a foreign domicile.

Declaration that the testatrix was domiciled in England, and decree for legacy duty and costs.

SUCCESSION DUTY.

In the House of Lords, March 1865.

The Attorney General *v* The Earl of Sefton.

The late Earl of Sefton died in 1855, *and the defendant, the present Earl, became entitled under the will of his father to certain real property, in respect to portions of which he paid succession duty, at the rate of* 1*l. per cent. on the value; with respect to other portions, amounting to* 48,000 *square yards, in the neighbourhood of Liverpool, he omitted such portions from his return for assessment, being advised that no duty was payable thereon, inasmuch as the same was not in demand or marketable as building land, nor was capable of being sold or let*

profitably as such, nor was capable of being used productively for agricultural or other purposes, and was then and had been for ten years previously and ever since wholly unoccupied and unproductive. He informed the officers of Inland Revenue of such omission, and his reasons for so omitting such portions, and was told in reply that if after any interval he should derive income or profit from such portions he would be expected to deliver a further account. Some time after the late Earl's death, the present Earl, still denying his liability to pay duty, gave notice to the officers of Inland Revenue that he had sold 1,561 *square yards of the land at* 16*s. per yard, and he subsequently sold a further portion thereof.*

Upon an information by the Attorney General, asking for duty at the rate of 1*l. per cent. in respect of the defendant's succession to the whole of the* 48,000 *square yards, or at least in respect of so much of such land as had then been or might at any time thereafter be sold or otherwise disposed of, it was held by the majority of the Court of Exchequer that the defendant was not liable to pay the duty claimed on any portion of the* 48,000 *square yards; that "annual value" in the 26th Section means present actual annual value, and that such value, and not possible or prospective annual value, is the basis on which succession duty is to be calculated, and this decision was affirmed on appeal by the House of Lords.*

Semble (*per the* Lord Chancellor *and* Lord Chelmsford) *that property such as that in the present case, capable of being sold, has an annual value within the meaning of the Act, and* (*per the* Lord Chancellor) *a value equal to interest at* 3*l. per cent on the sum that might have been realized if the property had been sold at the time of the accruing of the succession; and* (*per* Lord Chelmsford) *the value of an annuity which could be purchased with the amount for which the land would sell. But that, inasmuch as the Crown had in the present case assented to the statement of the Earl that the property was of no saleable value at the time of his succession, it must be bound by such assent.*

JUDGMENT.

The Lord Chancellor.—My Lords, two questions arise on this appeal; first, what is the subject of taxation in a succession, and, secondly, at what time is that subject to be ascertained and assessed. For this inquiry the material clauses of the Succession Duty Act appear to be the 10th and 21st sections. The 10th is the taxing clause, and it imposes duties according to "the value" of the succession, which value is ascertained by the machinery of the 21st section. By this latter section it is declared that the interest of every succession in real property (with certain exceptions) shall be considered to be of the value of an annuity equal to the annual value of such property (that is, of the property the interest in which constitutes the succession), after making

certain allowances ; and the questions which arise are, what is meant by annual value, and at what time such value is to be ascertained.

Are the words " annual value " satisfied by taking the actual yearly value of the property in its existing state and manner of enjoyment, or the value which it would yield if applied or enjoyed in a different manner? And is the annual value to be ascertained at the time of the accruer of the succesion, or will it include any future value which it is certain or probable that the property will have within a short period of time ? Upon these questions I think it clear that the value must be ascertained at the time of the accruer of the succession, and when the property is at that time yielding or capable of yielding annual income. I agree with the Lord Chief Baron and Mr. Baron Wilde, that the full present actual yearly value of the property in its existing state or mode of enjoyment is the subject of assessment.

I concur with Mr. Baron Wilde that no system of assessment or charge can be adopted which draws into the calculation of value a prospective or future benefit which is uncertain as to the time of its incidence. But there may be successions which at the time of accruer neither yield nor are capable of yielding in their existing state any annual income, but yet are saleable and would fetch in the market considerable sums, and in such cases I incline to think (but the point does not now require decision) that the property which forms the succession (not being excepted from the operation of the Act, which is the case with unopened mines, timber, and advowsons) has an annual value within the meaning of the Act, namely, a value equal to interest at 3*l.* per cent on the sum that might have been realized if the property had been sold at the time of the accruing of the succession, and that the successor cannot baffle the statute by postponing a sale until a future period. Such might have been the course adopted in the present case, for it is impossible to suppose that land which sold for a large sum of money within a few months after the accruer of the succession was not of some value to be sold at the time of the succession. But this course was not taken, and the present appeal must be decided on the facts which are clearly admitted by the Crown.

For if the property has not at the time when the interest of the successor accrues any saleable value, or any actual or potential annual value, it is clear that it is not capable of being assessed, and that it is not a " succession," which word is defined to mean property chargeable with duty under the Act. And this is as between the parties before us, the condition of the property in question. The information admits " that at the time of the death of the defendant's father, and of his be- " coming entitled to the land, the same was not in demand or marketable " as building land, nor was it capable of being sold or let profitably as " such." And then the word " profitably " is explained by the subsequent allegation, " that the land was not, at the time of the defendant's be- " coming entitled thereto, capable of being used productively for agricul- " tural or other purposes, and that such land was then and had been for " ten years previously and has ever since been wholly unoccupied and " unproductive, and that during no part of the time has any income or " annual profit been derived from it." Upon these admissions I am of opinion that the property the respondent's interest in which is alleged to be a succession had no assessable value at the time of the respondent becoming entitled, and that the Crown is not entitled to any duty ; I shall therefore move your Lordships that the decree of the Court below be affirmed, and that the petition of appeal be dismissed with costs.

Lord Wensleydale.—My lords, the question in this case, which is very important, arises upon an information on the Revenue side of the

Exchequer, on the Succession Duty Act, 16 & 17 Vict. c. 51. The somewhat loose and inaccurate form in which the information is drawn at first sight raised some little doubt what was the precise question meant to be raised. Upon carefully considering the statements of facts in the information, I have come to the conclusion that it is meant to be stated that the land had no annual value at the time that the present respondent succeeded to it; and the question for us to decide is, whether in that case the present Earl of Sefton is liable to sucession duty. The information states the death of the late Earl of Sefton on the 2nd of August 1855; that the respondent sold a part of the land in question in 1862, and a further part in the same year, in respect of which the Crown claims succession duty; that the crown and the respondent agreed that the land was not capable of being sold or let profitably as building land; that at the time of the respondent succeeding it was not capable of being used productively for agricultural or other purposes, and had been for ten years unoccupied and unproductive, and that no income or annual profit had been derived from it up to the time when the sale took place. That would leave the question unanswered whether it could be made productive of some annual profit with ordinary care. But the information goes on to state that the respondent sent a notice that the land in question was wholly unoccupied and unproductive and not capable of yielding income, fluctuating or otherwise, and that therefore the respondent was not liable to pay duty. And again, in April 1862 a notice was sent that the land in question was wholly unoccupied and unproductive and not capable of yielding income, fluctuating or otherwise, and that therefore he was not liable to succession duty. And the information states that those statements so made were according to the facts. We must, therefore, take them, I think, to be so.

It seems that the result of these statements in the information is, that at the time of the succession taking place on the death of the father the annual value of the waste land in question was nothing. The land produced no rent, and was incapable of yielding any, if ordinary care was taken to make it as productive as it could be reasonably made; and the question then for your Lordships is, whether, the annual produce during the first year of the succession being nothing, any succession duty is payable. I think it is not.

The very able opinions of the Lord Chief Baron and Mr. Baron Wilde, who have discussed the question most fully, have satisfied me that the calculation of the succession duty which is to be on successions according to their value (by Section 10), and is to be calculated by Section 21 at the value of an annuity equal to the *annual value* of the property, and payable from the date of the successor becoming entitled thereto in possession, in eight equal half-yearly instalments, the first to be paid twelve months next after the successor has become entitled to the *beneficial* enjoyment of the real property. The beneficial enjoyment means no more than in his own right, and for his own benefit, not as trustee for another. If the property is, then, of no annual value whatever, there is no basis whereon to make any calculations. If the land increased afterwards in value by the exertion and employment of the capital of the successor in improving his own property it is out of the question to suppose that such increase of value should be taxed. That never came in any degree from the predecessor. If the property should increase by the advancing prosperity of the neighbourhood, or by wholly accidental circumstances, as the discovery of minerals, such increase of value does not appear to have been in the contemplation of the Legislature. Neither its increase

nor diminution after the succession took place seems to have been thought of by the Legislature. This part of the case has been most ably discussed, and very satisfactorily to my mind, by two of the judges below, and particularly by Sir James Wilde, who has entered more fully into it. All that the Act says is, that the taxation in this particular case of land simply is to be according to the *annual* value, not the *whole* value, of the *corpus* of the land. For land of fluctuating value,—for land producing casual profit,—as timber, and for mines,—Act has made special provisions. For land alone, simply, the only mode of taxing is a per-centage, varying in amount with the remoteness of relationship, and in the clause imposing the duty expressly it is to be according to the *annual value*, beginning at the period of first enjoyment, and payable annually, the first portion at the end of the first year.

Baron Martin argues that it cannot be supposed that the Legislature could have meant to leave valuable land, much more valuable land than the best land used in agriculture, untaxed. But no proposition can be more clear than that, however likely it may be that such land should not be omitted, the subject cannot be taxed unless there are words clear enough to impose it. There must be clear words. There certainly are none of that character. It is clear that nothing but *annual value* is taxed. It was admitted, in the very able argument of the Attorney General, that whenever it is to be actually taxed, (and in the 21st section, which enacts the time of calculation,) no other time for its commencement is contemplated than the beginning of the succession ; and if there is no annual value there is none to calculate from, and what the Legislature requires cannot be done.

But it is contended that the moment annual value begins to arise the calculation ought to begin. Is this to be the case ? Is the waste land to be taxed if it becomes valuable ten or twenty years afterwards ? Is there to be a distinction between those cases in which it becomes annually profitable, although by the industry or capital of the successor himself, or in part from the same cause ? Are the eight half years to be dated from such an event, however remote ? Is there to be no inquiry whether that increased value is so caused in some degree by the successor's own capital or industry ? Is there to be a fresh date for each additional improvement in several years so as to have continual succession duties as to each part ? I consider that the Legislature never contemplated such a succession of taxes, which it would be difficult to ascertain and fairly to adjust ; but that they meant what they have said, as imposing the duty with respect to land, simply to fix it for the whole period of each succession once for all, and *that* according to one fixed criterion, viz., the annual value of the land at the time at which the succession begins.

There is no provision whatever made for any future calculations beginning from another period than the first period, than the first year of the succession, and if there is no annual value, then there is no duty. If there be any subsequent increase of value from any cause, the Crown will have the benefit of such increase on subsequent successions. As to the case suggested by my noble and learned friend, the Lord Chancellor, where land has no value at the time when the succession begins, but is capable of being sold and so producing an annual value on the interest of money, I do not think it necessary to give any opinion, as it does not arise in this case.

The Lord Chancellor, in the course of the argument, suggested for consideration whether the interpretation clause, which enacts that the term "succession shall denote any property chargeable with duty

under this Act" does not assist the Crown in this case. I do not feel sure in what way this enactment in the first section can be of use to the Crown. There is no doubt that the word "succession" does denote in the Act a succession liable to duty, and the Act provides for the mode of levying such duty; but it does not follow that everywhere when that term is used it has an addition to be made to it by construction, of a mode of levying it in another mode, if that provided is insufficient, as no doubt the Legislature mean the tax to be levied by eight half-yearly portions of the tax, beginning at the commencement of the succession; but you cannot, by virtue of the definition, add another beginning at a different time, when the mode of levying is inapplicable. Therefore I concur entirely with the motion of my noble and learned friend, the Lord Chancellor.

Lord Chelmsford.—My Lords, in determining the question of the liability of the defendant to the payment of succession duty, we must take the facts as they appear upon the face of the information, in which there is an admission that "the several statements contained in the "notice and letters set forth are according to the fact." Now, by the notice delivered to the Commissioners of Inland Revenue accompanying the defendant's account for assessment, it is stated that the plots of land as to which the question arises are "wholly unoccupied and un-"productive, and not capable of yielding income, fluctuating or other-"wise." The Board of Inland Revenue, acquiescing too readily in this statement, informed the defendant that if after any interval from the late Earl's death, he should derive income or profit from the land, he would be expected to deliver a further account, in order that the succession duty might then be calculated according to the value.

Now, whatever was the state of the land at the time of the succession, whether profitable or profitless, this mode of viewing the claim of the Crown was equally erroneous. Upon reference to the statute it will appear that the time when the question arises whether duty is to be paid, and if payable, upon what value, must be determined, once for all, when the succession falls, and cannot be left for future ascertainment. If at the time when the successor becomes entitled to the property it is utterly valueless and incapable of realizing any annual profit, the liability to duty is not to be left open to the possible contingency of its thereafter becoming valuable, but must depend altogether upon its actual present condition. If it possesses any value upon which the duty may be calculated, there can no more be any future estimate upon its improvement in value than there could be a return of duty upon the deterioration of the property after the proper duty payable when the succession fell had been ascertained and paid. This appears to me to be clear from a consideration of some of the sections of the Act. The 10th section enacts, "that there shall be levied and paid in respect of "every such succession aforesaid, according to the value thereof, the "following duties." These words necessarily refer to the preceding part of the Act, where the meaning of the word "succession" is explained. The interpretation clause (Section 1) states that in the construction and for the purposes of the Act, the term "succession" shall denote any property chargeable with duty under this Act. These words seem to be intended to embrace every description of property which in its own nature would be chargeable with duty, although from some accidental circumstance connected with it at the time when the succession falls, it might happen not to be capable of or liable to assessment. If they were construed to apply not merely to property of a kind to be *primâ facie* liable, but to such as from some present circumstance temporarily affecting it happens not to be in a condition to be the subject of an estimate for duty, there would be a conflict between the

meaning of the interpretation clause and of the second section. This latter section enacts that "any beneficial interest in property or in the "income thereof" (by which I understand a beneficial enjoyment, in contradistinction to holding as trustee) "shall be deemed to confer a "succession."

This succession arises upon the death of some person dying in possession or expectancy, therefore, the 10th section making every succession previously mentioned and explained liable to duty according to the value thereof, such value must necessarily be estimated at the time of the devolution of the property to the successor, even if there had been no other provisions than those in the Act. But the 20th section places the matter beyond doubt, for it enacts that the duty imposed by the Act shall be paid "at the time when the successor or "any person in his right or on his behalf" (words pointing to the case of a trust estate, and further explaining the words "beneficial interest" in the second section) "shall become entitled to the succession." The 20th section having provided for the period when the duty is to be paid (obviously meaning by the words "is to be paid" *becomes due*,) the 21st section enacts in what manner it shall be assessed, and at what times it shall be payable. Now, the interest of the successor is to be considered to be of the value of an annuity equal to the annual value of the property. There is no other mode provided for calculating the duty. If, therefore, when the successor becomes entitled in possession to his succession (being the point of time at which alone the duty imposed is to be ascertained in the manner prescribed by the Act) the property has no value, how can it possibly be made the subject of an assessment for duty, either then or at any subsequent period? I do not think that any of the sections referred to in the argument countenance the idea that the ascertainment of the duty to be paid can be postponed to any period after the death of the predecessor. The 37th section, providing for cases where a successor shall not have obtained the whole of his succession at the time of the duty becoming payable (that is, when he becomes entitled in possession to his succession) clearly does not mean where he shall not have realized the whole value of his succession, but where the property having devolved upon him by right, he has been kept out of some portion of it. In this case he is to be charged only with the value of the property or benefit of which he gets possession at the time of the succession, but specific provision is made for his being chargeable with duty on the property afterwards obtained by him; as to which some doubt might have arisen unless the case had been thus specially provided for.

The provisions of the 39th section are wholly inapplicable to the present case. They apply only where the value of a succession "shall "not be fairly ascertainable under any of the preceding directions." That is not the case with the land in question, for it is admitted by the information that it has been ascertained to be of no annual value whatever.

The 45th section, requiring the successor in the case of real property to give notice to the Commissioners "when any duty in respect thereof "shall first become payable," might, by the use of the word "first," introduce a little doubt and aid the argument, that unproductive property becoming productive would be liable to duty, and that consequently the Crown would be entitled to notice in such an event. But it appears to me that this word meets with its proper application in such sections as the 23rd and 24th with respect to timber and advowsons, and the 25th with respect to beneficial leases, which are instances of exceptions from the general rule contained in the 20th section as to the

liability to duty at the time when the successor becomes entitled in possession to his succession.

It was thrown out in the course of the argument, that from the words in the information, "the land in question was not capable of being sold or "let profitably as building land," it might be inferred that it would have realized some amount at the time of the defendant becoming entitled to the succession, although it might probably be sold or let more advantageously at some future period; and it was contended that if the land had a saleable value at the time when the succession fell to the defendant, it might be charged with succession duty. The difficulty would be in what manner the amount of duty to be paid would, under these circumstances, be arrived at. It can hardly be supposed to have been the intention of the Legislature that a valuable succession of this description should escape assessment altogether, and yet there would be no annual value to furnish a basis for the only mode of calculating the duty prescribed by the Act. Instead of considering "the interest of the succession" (in the words of the 21st section) "to be of the value of an annuity "equal to the annual value of the property," it would be necessary to ascertain the amount for which the land would sell, and then make that amount the assumed purchase money of an annuity to represent the duty. It appears to me that the 23rd and 24th sections, as to timber and advowsons "comprised in the succession," rather favour the view that for land yielding no annual value, but capable of immediately realizing a value by sale, the succession would be liable to succession duty. I do not understand that these subjects of property would have been exempt from duty, but for the special provisions respecting them. The language of the sections assumes that they would have been chargeable at once as "comprised in the succession." The rule as to the time and mode of charging the duty was introduced in case of the successor who, from the nature of the property, might possess it as a valuable part of the successoin, and yet derive no profit from it for many years.

I cannot help thinking that if the Crown had not acted upon an erroneous notion of the defendant's possible liability to duty at some future period, it would have been found that his land was not altogether valueless, and that the question might have been raised as to its liability to duty upon the marketable value as building land. But I must act upon the admission in the information, that the plots of land in question were wholly unoccupied, and not capable of yielding income, fluctuating or otherwise, and upon that ground alone I have come to the conclusion that the defendant was not chargeable with duty when he became entitled to his succession, and that he cannot be charged at any time afterwards. I therefore think that the judgment of the Court of Exchequer is right, and that it ought to be affirmed.

Decree affirmed, and Appeal dismissed with costs.

LONDON:
Printed by GEORGE E. EYRE and WILLIAM SPOTTISWOODE,
Printers to the Queen's most Excellent Majesty.
For Her Majesty's Stationery Office.

ELEVENTH REPORT

OF

THE POSTMASTER GENERAL,

ON

THE POST OFFICE.

Presented to both Houses of Parliament by Command of Her Majesty.

LONDON:
PRINTED BY GEORGE E. EYRE AND WILLIAM SPOTTISWOODE,
PRINTERS TO THE QUEEN'S MOST EXCELLENT MAJESTY.
FOR HER MAJESTY'S STATIONERY OFFICE.

1865.

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ELEVENTH REPORT.

To the Right Honourable the Lords Commissioners of Her Majesty's Treasury.

My Lords,

In the Tenth Annual Report on the Post Office I described the progress of the department during the year 1863, and during the 10 years over which this series of Reports had at that time extended; and after pointing out what had been done during the period to facilitate the circulation of correspondence and the transmission of money from place to place, and to furnish the working classes with the means of securely investing small savings, I showed what had been the result of these proceedings in each of the three great divisions of the kingdom.

In this, the Eleventh Report, I propose to continue the comparison upon the same plan, and to show what further progress was made in 1864.

The following table, which is similar in plan to that which appeared in the 12th and 13th pages of the Tenth Report, will give a tolerably complete view of the business of the Post Office, the Money Order Office, and the Post Office Savings Banks, in the London district, in the rest of England and Wales, in Scotland, and in Ireland, during 1863 and 1864, and will show the increase and per-centage of increase in each branch of business during the latter year.

I trust that the results which this table exhibits will be satisfactory to the country.

	Houses and Population.				Post Office.														
	Number of Inhabited Houses.		Population.		Number of Receptacles for Letters.		Proportion of Receptacles for Letters to Inhabited Houses, or Number of Houses to each Receptacle for Letters.		Total Number of Letters delivered in the Year.		Proportion of Letters to Population, or Number of Letters to each Person.		Proportion of Letters to Inhabited Houses, or Number of Letters to each Inhabited House.		Number of Book Packets, including chargeable Newspapers delivered in the Year.		Number of Free Newspapers delivered in the Year.		Numb Packet by the P Post de in the
	1863.	1864.	1863.	1864.	1863.	1864.	1863.	1864.	1863.	1864.	1863.	1864.	1863.	1864.	1863.	1864.	1863.	1864.	1863.
...don - -	445,787	455,779	3,316,932	3,351,000	1,045	1,095	1 R. to 426 H.	1 R. to 416 H.	161,600,322	170,191,853	48 to each person.	51 to each person.	362 L. to 1 H.	373 L. to 1 H.	8,139,843	9,520,706	6,298,604	7,015,190	Pattern Post not in operation till close of year.
Increase in London in 1864 over 1863 -	—	9,992	—	34,068	—	50	—	—	—	8,591,531 or at the rate of 5·31 per cent.	—	—	—	—	—	1,380,360 or at the rate of 16·96 per cent.	—	716,536 or at the rate of 11·37 per cent.	
The remainder of England and Wales -	3,407,581	3,438,212	17,380,724	17,563,959	10,722	11,032	1 R. to 317 H.	1 R to 311 H.	367,725,163	390,128,908	21 to each person.	22 to each person.	107 L. to 1 H.	113 L. to 1 H.	26,409,552	30,291,248	24,669,879	24,400,012	
Increase in the remainder of England and Wales in 1864 over 1863 -	—	30,631	—	183,235	—	310	—	—	—	22,403,745 or at the rate of 6·09 per cent.	—	—	—	—	—	3,881,696 or at the rate of 14·69 per cent.	Decrease -	269,867	
The whole of England and Wales - -	3,853,368	3,893,991	20,697,656	20,915,859	11,767	12,127	1 R. to 327 H.	1 R. to 321 H.	529,325,485	560,320,761	26 to each person.	27 to each person.	137 L. to 1 H.	144 L. to 1 H.	34,549,398	39,811,954	30,968,483	31,415,202	
Increase in the whole of England and Wales in 1864 over 1863 -	—	40,623	—	218,203	—	360	—	—	—	30,995,276 or at the rate of 5·85 per cent.	—	—	—	—	—	5,262,556 or at the rate of 15·23 per cent.	—	446,719 or at the rate of 1·44 per cent.	
Scotland - -	396,234	400,463	3,101,345	3,118,701	1,523	1,565	1 R. to 261 H.	1 R. to 255 H.	61,401,678	64,261,483	20 to each person.	20 to each person.	154 L. to 1 H.	160 L. to 1 H.	4,994,691	5,478,915	6,074,939	6,080,516	
Increase in Scotland in 1864 over 1863 -	—	2,229	—	17,356	—	42	—	—	—	2,859,805 or at the rate of 4·65 per cent.	—	—	—	—	—	484,224 or at the rate of 9·69 per cent.	—	5,577 or at the rate of ·09 per cent.	
Ireland - -	990,296	974,019	5,770,363	5,675,517	1,912	1,938	1 R. to 517 H.	1 R. to 502 H.	51,597,455	54,502,578	9 to each person.	9 to each person.	52 L. to 1 H.	56 L. to 1 H.	4,344,587	4,736,199	8,105,838	8,023,054	
Increase in Ireland in 1864 over 1863 -	Decrease	16,277	Decrease	94,846	—	26	—	—	—	2,905,123 or at the rate of 5·63 per cent.	—	—	—	—	—	391,612 or at the rate of 9·01 per cent.	Decrease -	82,784	
The United Kingdom -	5,241,898	5,268,473	29,569,364	29,710,077	15,202	15,630	1 R. to 344 H.	1 R. to 337 H.	642,324,618	679,084,822	22 to each person.	23 to each person.	122 L. to 1 H.	129 L. to 1 H.	43,888,676	50,027,068	45,149,260	45,518,772	
Increase in the United Kingdom in 1864 over 1863 -	—	26,575	—	140,713	—	428	—	—	—	36,760,204 or at the rate of 5·72 per cent.	—	—	—	—	—	6,138,392 or at the rate of 13·98 per cent.	—	369,512 or at the rate of ·81 per cent.	

Money Order Offices.							Post Office Savings Banks.										
Number of Money Order Offices.	Proportion of Money Order Offices to Inhabited Houses.		Amount of Money Orders issued.		Amount of Money Orders paid.		No. of Post Office Savings Banks.		Proportion of Post Office Savings Banks to Inhabited Houses.		Number of Depositors.		Balance due to Depositors.		Total No. of Depositors in old Savings Banks and Post Office Savings Banks combined, on the 31 March 1864.	Total Number of Depositors in old Savings Banks and Post Office Savings Banks combined on the 31 March 1865.	Proportion of Savings Bank Depositors to Population in the Years ending 31 March 1864 and 31 March 1865.	
1864.	1863.	1864.	1863.	1864.	1863.	1864.	31 Mar. 1864.	31 Mar. 1865.	31 March 1864.	31 March 1865.	31 March 1864.	31 March 1865.	31 March 1864.	31 March 1865.				
394	1 M. O. O. to 1,195 H.	1 M. O. O. to 1,156 H.	£ 3,181,874	£ 3,265,796	£ 4,688,301	£ 4,844,632	374	374	1 P. O. S. B. to 1,191 H.	1 P. O. S. B. to 1,218 H.	117,955	166,283	£ 1,143,337	£ 1,492,386	422,672	466,577	1 Depositor to 7 Persons.	London.
21	—	—	—	83,922 or at the rate of 2·63 per cent.	—	156,331 or at the rate of 3·33 per cent.	—	Nil.	—	—	—	48,328 or at the rate of 40·97 per cent.	—	349,049 or at the rate of 30·52 per cent.	—	43,905 or at the rate of 10·38 per cent.	—	Increase in London in 1864 over 1863.
1,886	1 M. O. O. to 1,917 H.	1 M. O. O. to 1,823 H.	£ 10,906,009	£ 11,541,229	£ 9,231,274	£ 9,768,847	1,786	1,849	1 P. O. S. B. to 1,908 H.	1 P. O. S. B. to 1,859 H.	221,678	316,354	£ 2,685,467	£ 3,557,890	1,209,566	1,275,295	1 Depositor to 14 Persons.	The remainder of England and Wales.
109	—	—	—	635,220 or at the rate of 5·82 per cent.	—	537,573 or at the rate of 5·82 per cent.	—	63	—	—	—	94,676 or at the rate of 42·7 per cent.	—	872,423 or at the rate of 32·48 per cent.	—	65,729 or at the rate of 5·43 per cent.	—	Increase in the remainder of England and Wales in 1864 over 1863.
2,280	1 M. O. O. to 1,792 H.	1 M. O. O. to 1,707 H.	£ 14,087,883	£ 14,807,025	£ 13,919,575	£ 14,613,479	2,160	2,223	1 P. O. S. B. to 1,784 H.	1 P. O. S. B. to 1,751 H.	339,633	482,637	£ 3,828,804	£ 5,050,276	1,632,238	1,711,872	1 Depositor to 12 Persons.	The whole of England and Wales.
180	—	—	—	719,142 or at the rate of 5·1 per cent.	—	693,904 or at the rate of 4·98 per cent.	—	63	—	—	—	143,004 or at the rate of 42·1 per cent.	—	1,221,472 or at the rate of 31·9 per cent.	—	109,634 or at the rate of 6·71 per cent.	—	Increase in the whole of England and Wales in 1864 over 1863.
363	1 M. O. O. to 1,131 H.	1 M. O. O. to 1,103 H.	£ 1,305,871	£ 1,367,361	£ 1,394,178	£ 1,496,043	354	357	1 P. O. S. B. to 1,124 H.	1 P. O. S. B. to 1,121 H.	18,683	24,022	£ 107,932	£ 127,453	173,981	184,681	1 Depositor to 17 Persons.	Scotland.
11	—	—	—	61,490 or at the rate of 4·7 per cent.	—	101,865 or at the rate of 7·3 per cent.	—	3	—	—	—	5,339 or at the rate of 28·57 per cent.	—	19,521 or at the rate of 18·08 per cent.	—	10,700 or at the rate of 6·15 per cent.	—	Increase in Scotland in 1864 over 1863.
516	1 M. O. O. to 1,968 H.	1 M. O. O. to 1,887 H.	£ 1,100,039	£ 1,142,707	£ 1,324,518	£ 1,434,595	510	517	1 P. O. S. B. to 1,941 H.	1 P. O. S. B. to 1,883 H.	14,639	17,681	£ 160,756	£ 188,196	81,291	80,738	1 Depositor to 70 Persons.	Ireland.
13	—	—	—	42,668 or at the rate of 3·87 per cent.	—	110,077 or at the rate of 8·31 per cent.	—	7	—	—	—	3,042 or at the rate of 20·78 per cent.	—	27,440 or at the rate of 17·06 per cent.	—	Decrease 553	—	Increase in Ireland in 1864 over 1863.
3,159	1 M. O. O. to 1,744 H.	1 M. O. O. to 1,667 H.	£ 16,493,793	£ 17,317,093	£ 16,638,271	£ 17,544,117	3,024	3,097	1 P. O. S. B. to 1,733 H.	1 P. O. S. B. to 1,701 H.	372,955	524,340	£ 4,097,492	£ 5,365,925	1,887,510	2,007,291	1 Depositor to 15 Persons.	The United Kingdom.
154	—	—	—	823,300 or at the rate of 4·99 per cent.	—	905,846 or at the rate of 5·44 per cent.	—	73	—	—	—	151,385 or at the rate of 40·59 per cent.	—	1,268,433 or at the rate of 30·95 per cent.	—	119,781 or at the rate of 6·34 per cent.	—	Increase in the United Kingdom in 1864 over 1863.

Improvements of Postal Accommodation during the Year.

Receptacles for Letters.

It will be seen from the foregoing table that the increase, during 1864, in the number of receptacles for letters has been more than proportionate to the increase in the number of inhabited houses, since London, which at the end of 1863 had one receptacle for letters to every 426 houses, had one such receptacle to every 416 houses at the end of 1864. A like increase in the proportion of receptacles for letters to inhabited houses took place in each division of the kingdom.

Free Deliveries.

During the year 1864 free deliveries were for the first time established at 413 places (exclusive of single houses) in the United Kingdom; and in the same period additional free deliveries were given to 100 places, whilst the boundaries of 88 other free deliveries were enlarged.

Day Mails.

The following table will show how many of the towns in England and Wales were provided in 1864 with additional means of communicating with London, and at the same time with additional means of communicating with many other towns:—

Year.	Towns having a Night and Day Mail from London.	Towns having a Night and Day Mail to London.	Towns having three Mails daily from London.	Towns having three Mails daily to London.	Towns having four Mails daily from London.	Towns having four Mails daily to London.	Towns having five Mails daily from London.	Towns having five Mails daily to London.
1863	393	264	50	73	7	15	3	6
1864	397	276	55	78	10	15	3	6
Increase -	4	12	5	5	3	—	—	—

In Scotland 24 additional towns were provided with a Day Mail to Edinburgh, and 14 with a Day Mail from Edinburgh; and in Ireland 10 additional towns were provided with a Day Mail to and a Day Mail from Dublin.

Accelerations of Mails.

During the year 1864, by the employment of the newly opened Cambrian Railway from Shrewsbury to Aberystwith, a very important acceleration of the Mails was afforded to an

extensive district in which the postal accommodation had previously been defective. For instance, Aberystwith itself obtained an arrival in the morning at about 10.0 a.m., with a despatch in the evening at about 5.30 p.m., in exchange for an arrival at about 2 p.m. and a despatch at about 11 a.m.

The benefit to Aberystwith as regards its communication with London may be thus shown. In 1863, a letter leaving London on Monday night reached Aberystwith at 2 p.m. on Tuesday, and its reply, if posted in time for despatch at 11 a.m. on Wednesday, reached London on Thursday morning. In 1864 such a letter reached Aberystwith at about 10 a.m. on Tuesday, and its reply, if posted up to about 4.30 p.m. on Tuesday, reached London on Wednesday morning.

In the adjacent neighbourhood of Dolgelly an important acceleration of the Mail was also afforded under a separate arrangement and, although the arrival at Dolgelly has been since somewhat irregular, the change has, notwithstanding, been very beneficial.

The Mails to and from Falmouth and Penzance, and Cornwall generally, were greatly accelerated by an increase in the speed of the trains west of Bristol, and, as regards Falmouth itself, by the employment of the newly opened Railway from Truro to Falmouth. Many remote places in the west of Cornwall thus obtained the means of despatching a reply to London on the day on which they received a letter, instead of having to wait until the next day, as had previously been the case.

A Night Mail train was established between London and Leicester by the Midland Railway Company's line viâ Hitchin and Bedford, and this was attended with advantage over the previous route by the London and North-western line viâ Rugby, inasmuch as it improved the communication between neighbouring districts, which had previously been unsatisfactory.

Many ordinary trains, belonging to various Railway companies with which the department has general contracts, were brought into use for the conveyance of Mails where increased accommodation could thus be afforded, and the system of making a fixed annual payment to include the general use of all ordinary trains was extended to several lines of Railways upon which it had not previously been in operation.

In Scotland the most important improvement was the transfer of the Mails to and from Inverness, and the north of Scotland generally, from the circuitous route by way of Aberdeen to the more direct route viâ Dunkeld, Blair Athol, and Kingussie, this alteration being made in consequence of the opening of the direct Railway from Perth to Inverness. By the transfer of the Mails to this line the extensive district from Forres to John O'Groats gained about four hours in the arrival and three hours in the despatch of its London Night Mail. Inverness obtained also an arrival of its London Day Mail at 9 a.m. instead of at 1.45 p.m., and a despatch which had not previously existed, in connexion with the Day Mail to London, that despatch taking place at 12.40 p.m.

It further obtained the advantage of an additional and very convenient Mail to Edinburgh and Glasgow between 7 and 8 p.m.

The acceleration arising from the use of the Direct Perth and Inverness Railway was extended in some degree to Elgin and Fochabers, as, although those towns are situated on the Aberdeen side of Forres, it was found that they could be served with greater advantage by a branch train from Forres than by the old route through Aberdeen.

The measure above referred to was carried into effect in the month of June, and in the following October the department placed the Mails from Invergordon to Tain on the extended line of Railway, by which a large district in the extreme north, including part of Rossshire, together with Sutherlandshire and Caithnessshire, obtained a further acceleration.

The most northern town of Scotland is Thurso, 755 miles distant from London, and the combined effect of these accelerations was to admit of a letter despatched from London on Monday night being delivered in Thurso early on Wednesday morning, and of its reply, if posted at about four o'clock on Wednesday afternoon, reaching London in time for the first delivery on Friday morning.

Contracts were entered into for the general use, at a fixed annual rate, of all the ordinary trains on the lines above referred to between Perth, Inverness, and Tain, and also on the lines belonging to the Great North of Scotland Railway Company. The contract with this latter company enabled the Post Office to afford additional accommodation to the public in several ways, and in particular by the substitution of Railway for Mail cart service to Peterhead and other places in the neighbourhood of Aberdeen.

Several other smaller lines of Railway in different parts of Scotland were used for the first time, or were used more extensively than before, for Mail purposes, and amongst others those to Peebles and Innerleithen were employed, by which means an improvement of the posts in that neighbourhood was effected.

A Mail coach was established between Kingussie and Fort William, by which means a very extensive district on the west coast of Scotland was brought into direct connexion with the newly established London Night Mail trains on the Perth and Inverness Railway.

No very extensive alterations took place in Ireland during this year (1864), but additional accommodation was in several instances afforded, as, for instance, by the establishment of a Day Mail Service on the Railway between Roscommon and Castlebar, and by the extension of the Day Mail from Castlebar to Ballina and Westport by Car Service.

Foreign and Colonial Posts.

The principal improvements in regard to postal communication between this country and foreign countries and colonies during the year were—

1. The reduction in the rates of postage on correspondence between this country and Holland (the postage on a single paid letter being reduced from 8*d.* to 3*d.*), which reduction has been followed by an increase, at the rate of 50 per cent., in the correspondence between the two countries; and

2. The establishment of a second Mail Service in each month, viâ the Mauritius, between this country and the Cape of Good Hope. The effect of the establishment of this second service is briefly, that there is a despatch by the old route from Plymouth to the Cape on the 10th of each month, and a further despatch, viâ Egypt and the Mauritius, on the 20th and 26th of each month; and that letters which are sent by the Mauritius route reach the Cape five days, Algoa Bay 14 days, and Natal 22 days, earlier than they would arrive if they were held over until the next monthly transmission from Plymouth.

Increase of Correspondence.

The table at page 2 will show that the increase of correspondence in 1864, which increase in the gross amounted to 37,000,000 of letters, and 7,000,000 of books, papers, and patterns, was more than proportionate to the increase of population in the London district, and in the rest of England and Wales, and more than proportionate to the increase in the number of inhabited houses in all parts of the kingdom.

In the London district the proportion of letters to population rose from 48 per head per annum in 1863, to 51 per head per annum in 1864; and the proportion of letters to inhabited houses rose from 362 per house per annum in 1863, to 373 per house per annum in 1864.

In both years the total number of letters delivered in the London district would have been more than sufficient to give a delivery of one letter on every working day to each house throughout the district.

The following table will show roughly the growth during the year 1864 of the correspondence between this country and foreign countries and colonies:—

	In 1863.	In 1864.
The letters passing between this country and France (*i.e.*, in both directions) were	6,373,000	6,771,000
The letters between this country and Spain were	522,000	617,000
The letters between this country and Italy were	742,000	827,000
The letters between this country and Belgium were	838,000	924,000
The letters between this country and Holland were	523,000	600,000
The letters between this country and Prussia, Hamburg, and Bremen were	4,013,000	4,403,000
The letters between this country and the East Indies, China, &c. were	3,372,000	3,632,000
The letters between this country and Australia were	2,693,000	2,915,000
The letters between this country and the West Indies, the Pacific, and the Brazils were	1,662,000	1,727,000
The letters between this country and Canada and British North America and the United States were	4,474,000	4,865,000

On the whole, 28,000,000 of letters, and 21,500,000 of books, papers, and patterns, passed between this country and foreign countries and colonies in 1864, there being an increase on the previous year of 2,000,000 of letters, and 2,500,000 of books, papers, and patterns.

Up to the close of 1864 no change had taken place in the proportion borne by the foreign and colonial letters coming into the United Kingdom to the whole number of letters delivered in the kingdom. The foreign and colonial letters formed, as in many previous years, about one-fiftieth part of the whole number of letters delivered.

The increase during 1864 in the number of circulars sent through the post in letters appears to have been considerable. In 1863 an account was taken of 4,000,000 letters which were posted in London, and which obviously contained circulars, and could be assigned to various trades and societies in proportions which were exhibited in a table at page 28 of the Tenth Annual Report. In 1864 a similar account was taken of 4,600,000 letters posted in London, and obviously containing circulars.

	In 1863.	In 1864.
Of these circulars there were transmitted by drapers -	1,690,000	1,780,000
" " by railway companies -	348,000	404,000
" " by insurance companies -	292,000	388,000
" " by wine merchants - -	101,000	386,000
" " by charitable institutions -	307,000	261,000
" " by publishers and booksellers	58,000	189,000
" " and by lottery offices - -	141,000	169,000

In addition to the circulars which were transmitted in letters, largely increased numbers were in 1864 transmitted by the book post. During that year it was observed that—

	Book Circulars.
There were posted in London by railway companies - -	316,000
" " by drapers - - -	282,000
" " by charitable institutions - -	279,000
" " by building and mining companies	210,000
" " by wine merchants - -	197,000
" " by medical men and dentists -	177,000
" " by insurance companies - -	113,000
" " and by tailors - - -	108,000

There was also a considerable increase in 1864 in the number of valentines, as the following statement will show :—

Estimated Number of VALENTINES posted in London.

YEAR.	For Delivery in London.	For Delivery in the Country.	TOTAL.
1863 - - - - -	299,200	195,500	494,700
1864 - - - - -	326,300	204,000	530,300
Increase in 1864 -	27,100	8,500	35,600

In both years the number of valentines posted in the Western Postal district of London was nearly one-fourth of the whole number posted in London.

The increase in the number of registered letters during the year was at the rate of $8\frac{1}{2}$ per cent. (the increase in the number of ordinary letters being at the rate of only $5\frac{7}{10}$ per cent.), making the total number of registered letters for the year about 2,130,000. During the year 1864 only 14 registered letters were lost in this country, and of these 2 were contained in the Macclesfield Mail Bag, which was stolen from the standard of the apparatus for exchanging bags at the Chelford Railway Station on the night of the 1st April 1864. The perpetrator of this robbery was very shortly discovered, convicted, and sentenced to 10 years' penal servitude.

The regulations which were framed in 1861 for the compulsory registration of letters containing coin, if posted as ordinary letters, have had the effect of diminishing very largely the number of unregistered coin letters. A great reduction in the number of such letters had taken place up to the close of 1863, and during the year 1864 a further reduction of about 30 per cent. is believed to have taken place.

The following table shows the numbers of returned letters in the years 1863 and 1864, and the manner in which they were disposed of:—

		In 1863.	In 1864.
Total number of returned letters - - -		2,864,035	3,154,089
Returned to the writers - - - -		2,159,341	2,428,612
Re-issued to corrected addresses - - -		98,085	116,142
Returned unopened to foreign countries - -		98,302	111,314
Destroyed - - - - -	about	493,000	483,000
In hand - - - - -	about	15,307	15,021
		2,864,035	3,154,089

The proportion of returned letters to the whole number of letters rose from ·44 per cent. in 1863 to ·46 per cent. in 1864, but this very trifling increase was more than counterbalanced by

the fact that the proportion of returned letters which could not be satisfactorily disposed of fell from 17 per cent. in 1863 to 15 per cent. in 1864.

The proportion of returned letters to total correspondence is, moreover, much lower in the United Kingdom than in Foreign Countries. For example, in the year 1864:—

	Returned Letters.	Letters.
The United Kingdom had - -	3,154,000 to	679,000,000
Whilst France had - - - -	2,034,000 to	298,000,000
Italy had - - - - - -	865,000 to	67,000,000
And the United States had - -	4,368,000 to	467,000,000

The progress of the Book Post during the year calls for no comment, and the Pattern Post was so fully described in the Tenth Annual Report as to render further remarks on it in this Report unnecessary.

The Money Order Office.

The increase in the number of Money Order Offices during the year 1864 was in every part of the kingdom more than proportionate to the increase in the number of inhabited houses, and the increase in the business of the Money Order Office was nearly equally distributed over the whole kingdom.

During the year Money Order business was established between this country and the Colonies of Nova Scotia, Prince Edward Island, Trinidad, Newfoundland, Montserrat, St. Vincent, Bahamas, and St. Lucia. The following table will show the nature and amount of the Money Order business transacted between this country and the Colonies during 1863 and 1864:—

Year.	Money Orders issued in United Kingdom for payment in Colonies.		Money Orders issued in Colonies and paid in United Kingdom.	
	Number.	Amount.	Number.	Amount.
		£		£
1863 - - - -	8,194	31,373	44,720	177,314
1864 - - - -	10,326	40,173	62,590	272,074
Increase - - - -	2,132	8,800	17,870	94,760

It will be seen from the above statement that the increase of business in both directions was considerable.

The Act 27 & 28 Vict., cap. 56, which was passed in the year 1864, contained the following clause:—

"When any person liable to the payment of any of the duties of land tax, assessed taxes, or income tax in Scotland shall have received the accustomed notice thereof, it shall be lawful for him, within twenty-one days after receiving such notice, to produce the same at any Money Order Office of the General Post Office in Scotland, and pay to the postmaster there the sum payable according to such notice, and thereupon the said postmaster shall deliver to him a Post Office Order payable at the General Post Office in London to the Receiver General of Inland Revenue for the said sum, *less the commission for such order*, which order such person shall forthwith transmit to the collector at the office for receipt in a letter prepaid by being duly stamped with the proper postage stamp or stamps, specifying the particulars of the payment in such form as shall be provided by the Commissioners of Inland Revenue for that purpose, and delivered to the said person along with the said order; and upon the receipt of the said order and letter, with the particulars and in the form aforesaid, the collector shall credit the person named in the said letter with the amount specified in the said order, and with the said commission, in like manner as if the same had been paid to the collector in cash."

The Act came into operation in the autumn of 1864, and at the next ensuing period for the payment of taxes, upwards of 2,300 persons in Scotland availed themselves of the provisions of the clause which I have quoted, and remitted to the tax collectors, by means of money orders, upwards of 7,000*l.*

I may note here that the Act above referred to also contained the following clause:—

"It shall be lawful for the Lords Commissioners of Her Majesty's Treasury, if they shall see fit, and under such regulations, conditions, and limitations as they shall think proper, to authorize and direct the Commissioners of Inland Revenue and their officers to receive postage stamps as and for payment of the respective taxes of land tax and assessed taxes and income tax, or any of them, which may become due or payable in Scotland or Ireland; and, under such regulations as aforesaid, such postage stamps shall be delivered over to the Postmaster General or his officers, and the amount or value thereof be paid out of the revenue of the Post Office to the Inland Revenue, and accounted for as monies arising from the said taxes."

The proper steps were taken to give effect to this clause, and in Scotland taxes to the amount of nearly 1,000*l.* were paid in postage stamps at the period of payment next following the promulgation of the Act; but in Ireland very little advantage was taken of the accommodation afforded by the clause.

Little, if any, change took place in 1864 in the distribution of Money Order business in the principal divisions of the kingdom.

The amount remitted to London continued to be largely in excess of the amount remitted from London, and the amount remitted to Ireland continued to be largely in excess of the amount remitted from Ireland.

The excess of the remittances to London is in accordance with the ordinary course of trade, but the excess in the remittances to Ireland is mainly attributable to the employment of the Money Order Office by Irish reapers and hay-makers for the purpose of remitting to their own country the sums which they earn in England and Scotland. Some, indeed, have been known to use the Money Order Office for the purpose of transmitting their money from town to town along their whole route, by which means they have not merely avoided the risk of losing their money on the road, but have been enabled, by repeatedly drawing it out and paying it in again, to satisfy themselves from time to time of its safety.

As a general rule each town in England has its greatest amount of Money Order business with London, and but a small amount of such business with any other single town. There are, however, exceptions to this rule, some of which may be noted here. Of the Money Order business at Barnsley, for instance, 13 per cent. is with London, 11 per cent. with Leeds, 9 per cent. with Manchester, and 6 per cent. with Sheffield. Of the Money Order business at Blackburn, 14 per cent. is with London and 17 per cent. with Manchester. Of the Money Order business at Bolton, 15 per cent. is with London, 9 per cent. with Liverpool, and 17 per cent. with Manchester. Of the Money Order business at Bradford, 14 per cent. is with London and 10 per cent. with Manchester. Of the Money Order business at Burnley, 9 per cent. is with London and 22 per cent. with Manchester. Of the Money Order business at Cardiff, 18 per cent. is with London and 13 per cent. with Bristol. Of the Money Order business at Chester, 18 per cent. is with London and 14 per cent. with Liverpool. Of the Money Order business at Coventry, 28 per cent. is with London and 14 per cent. with Birmingham. Of the Money Order business at Dewsbury, 17 per cent. is with London, 13 per cent. with Leeds, 9 per cent. with Manchester, and 11 per cent. with Liverpool. Of the Money Order business at Dudley, 14 per cent. is with London and 12 per cent. with Birmingham. Of the Money Order business at Stafford, 21 per cent. is with London and 16 per cent. with Birmingham. Of the Money Order business at Worcester, 21 per cent. is with London and 14 per cent. with Birmingham; and of the Money Order business at Wolverhampton, 20 per cent. is with London, and 17 per cent. is with Birmingham. It is presumed that in these cases the Money Order business follows the ordinary course of trade.

Post Office Savings Banks.

The increase in the business of the Post Office Savings Banks during the year ending on 31st March 1865, was very remarkable, since, though only 73 additional Banks were opened during the year, the increase in the number of depositors during the year was at the rate of 40 per cent., the rate of increase during the

previous year, in which year 161 additional Banks were opened, having been at the rate of 42 per cent.

The increase in the number of depositors in Post Office Savings Banks is constant, and subject to very little variation. It is at its highest point in January and February, and at its lowest point in November and December of each year, but on the whole year it amounts, and for a long time has amounted, to a net increase of from 11,000 to 12,000 depositors per month, the term "net increase" being used to denote the difference between the number of depositors coming in and the number going out during the month.

For some time after the first establishment of Post Office Savings Banks, the average amount of each sum deposited ranged between 3*l.* and 4*l.*, whereas the average amount of each sum deposited in the old Savings Banks had usually ranged between 4*l.* and 5*l.* As, however, the nature and advantages of the Post Office Banks became known to the poorer classes of the community, and as new Banks were opened from time to time in rural districts, or in those parts of great cities which were inhabited by large numbers of the poorer classes, a gradual reduction in the average amount of each deposit took place, and that amount has for some time ranged between 2*l.* and 3*l.*, whilst the average amount of each sum deposited in the old Savings Banks has not undergone any marked alteration.

So long as this constant influx of new depositors continues, and continues to be accompanied by a gradual fall in the average amount of each sum deposited, no marked increase can be expected to take place in the average amount due to each depositor. That amount has for some time ranged between 10*l.* and 11*l.*, and under the operation of existing circumstances will not reach 11*l.* for some time to come.

On the whole, it seems reasonable to expect that the annual increase in the business of Post Office Savings Banks will for some time be from 130,000 to 140,000 in the number of depositors, and from 1,400,000*l.* to 1,500,000*l.* in the capital of depositors.

During the year ending 31st March, 1865, the capital sum due to all the depositors in Post Office Savings Banks throughout the kingdom increased at the rate of 31 per cent. The sum due to depositors in England and Wales increased at the rate of 32 per cent.; the sum due to the depositors in Scotland increased at the rate of 18 per cent., and the sum due to the depositors in Ireland increased at the rate of 17 per cent. The rate of increase was, however, much higher in some counties of England and Wales. Thus it was 71 per cent. in Cornwall, 57 per cent. in Dorsetshire, 56 per cent. in Monmouthshire, 69 per cent. in Shropshire, 50 per cent. in Hampshire, 56 per cent. in Leicestershire, 52 per cent. in Worcestershire, and 56 per cent. in Yorkshire.

Although, as I have shown, largely increasing numbers of persons use the Post Office Savings Banks for a prolonged in-

vestment of their savings, there are in the Post Office Savings Banks, as in the old Savings Banks, large numbers of other persons who use the Banks for a short time only as mere places of security for the money which they do not require for immediate use. The total sum deposited up to the 31st March, 1865, inclusive of interest, in Post Office Banks, was 9,217,000*l.*, and of this sum 3,852,000*l.*, or 42 per cent., had been withdrawn up to that date. The total number of depositors who had entered up to that date was 690,912, and of these 166,572, or 24 per cent., had closed their accounts.

The labour and the cost of the Post Office Banks up to the 31st March, 1865, must be measured, as a matter of course, not by the number of accounts remaining open at that date, but by the whole amount of business on all accounts opened and closed up to that date, or, in other words, by the whole number of transactions to that date.

The cost of each transaction, *i.e.* of each deposit or of each withdrawal, in Post Office Savings Banks, continued up to the 31st March 1865, to be rather less than sevenpence, to which sum, prior to the passing of the Act for the establishment of Post Office Savings Banks, it was estimated that the cost of each transaction would attain.

From an examination into the occupations of about 11,000 depositors in Post Office Savings Banks, in all parts of the kingdom, it appears probable that the 524,340 depositors who had opened accounts in the Post Office Banks on the 31st March 1865, may be thus classified:

Females, Male Minors, and Trustees - -	285,769
Males of independent Means, or of no stated Occupation, Professional Men, and their Clerks or Assistants - - - - -	31,353
Males engaged in Education - - -	5,692
Tradesmen and their Male Assistants, Farmers, and Clerks of all kinds, except Clerks to Professional Men, and Clerks in General Offices - -	53,756
Mechanics and Artizans, Journeymen Mechanics, and Artizans, Domestic Servants, Farm Servants, Railway Servants, Policemen, Labourers, Pensioners, Boatmen, Fishermen and Merchant Seamen - - - - - -	140,518
Persons employed in the Revenue Departments -	2,570
Persons in the Army or Navy - - -	4,682
Total -	524,340

Of the whole number of depositors in Post Office Savings Banks nearly one-third reside within the limits of the London Postal district. Of the whole number of depositors in the Post Office Banks throughout the kingdom, about 4 per cent. have balances due to them of 50*l.* and upwards.

The table at page 3 of this Report gives a statement, which is partly the result of estimate, but is sufficiently reliable, of the total number of depositors in Post Office Savings Banks and Old Savings banks combined, on the 31st March 1864 and 31st

March 1865. The increase in the number of depositors, it will be seen, has kept pace with the increase of population.

In London, it will be observed, there was in each year, one depositor to every seven persons ; in the rest of England and Wales one depositor to every fourteen persons ; in Scotland one depositor to every seventeen persons ; in Ireland one depositor to every seventy persons ; and in the whole of the United Kingdom one depositor to every fifteen persons.

It has been stated on authority that in Paris, as in London, there is one Savings Bank depositor to every seven persons, but that in the whole of France there is only one depositor to every 25 persons.

Revenue and Expenditure.

The following tables give in considerable detail the particulars of the actual expenditure (inclusive of the cost of Mail Packets), and of the actual Gross and Net Revenue, and of the Total Effective and Non-effective Force of the Post Office in each of the Ten Years from 1855 to 1864.

Force and Expenditure.

Date.	Force.		Cost of Collection and Delivery, of Management, and of Money Order Business.					Cost of Conveyance of Mails.					Total Cost of Post Office Service.
	Effective.	Non-Effective.											
	Staff Officers, Postmasters, Clerks, Sorters, Stampers, Messengers, Guards, Letter Carriers.	Pensioners.	Salaries, Wages, Pensions, Travelling Allowances, Poundage on Sale of Stamps, Commission on Money Order business Cost of Uniform Clothing, Medical Expenses, and Cost of Substitutes during Annual Holidays or Sickness of Officers and Men, Official Postage, Law Charges, and Incidental Expenses.	Manufacture of Postage Stamps, i.e., Printing, Paper, and Miscellaneous Charges.	Stationery.	Buildings and Repairs, Rents, Rates, Taxes, Fuel, and Light.	Total Cost of Collection, Delivery, and Management, and of Money Order Business.	Conveyance by Coaches, Carts, and Omnibuses.	Conveyance by Railways.	Cost of Supply and Repair of Mail Bags and Boxes, Tolls, and Ferriage, Cost of Apparatus for Exchange of Bags conveyed by Railway, and Miscellaneous Expenses.	Conveyance of Mails by private Ships and by Packets under Contract with Admiralty or Post Office.	Conveyance of Mails over Isthmus of Suez and Isthmus of Panama, and in other Foreign Parts, and Salaries of Admiralty Agents and other Officers in charge of Foreign and Colonial Mails.	Total Cost of Conveyance.	
	£	£	£	£	£	£	£	£	£	£	£	£	£
1855	22,547	344	935,635	19,467	25,464	43,072	1,044,638	139,089	440,320	13,950	743,746	26,309	1,363,414	2,408,052
1856	23,130	427	1,021,656	19,022	22,491	50,297	1,112,466	141,835	376,363	15,505	759,397	26,531	1,319,628	2,432,094
1857	23,545	481	1,033,667	19,933	27,349	44,893	1,125,842	147,177	422,943	19,344	823,697	22,930	1,439,091	2,564,933
1858	24,186	501	1,075,217	17,988	28,241	93,870	1,215,316	145,616	545,073	18,907	935,883	28,371	1,673,850	2,889,166
1859	24,608	589	1,167,656	20,094	28,642	106,478	1,322,870	147,005	428,647	24,230	948,038	28,730	1,577,600	2,900,470
1860	25,192	765	1,140,306	19,177	34,223	62,215	1,256,011	150,868	490,223	26,985	869,952	29,647	1,567,175	2,823,186
1861	25,376	862	1,214,303	19,414	27,897	83,702	1,347,316	152,508	655,046	25,929	910,657	33,071	1,807,211	3,154,527
1862	25,285	927	1,249,268	19,261	25,821	84,795	1,379,145	152,280	526,966	22,803	821,067	24,700	1,547,406	2,926,551
1863	25,402	1,017	1,254,605	18,485	26,617	81,548	1,381,255	149,333	538,512	20,189	837,655	29,542	1,575,231	2,956,486
1864	25,637	1,131	1,322,945	19,750	23,499	39,730	1,408,924	145,039	565,852	21,807	900,610	29,053	1,663,311	3,072,235

Gross and Net Revenue.

Year.	Gross Revenue from Letters, Books, Packets, &c.	Money Order Commission.	Gross Revenue collected by the Post Office.	Produce of the Impressed Stamp on Newspapers collected by Inland Revenue Office.	Total Postal Revenue.	Total Cost of Post Office Service.	Net Revenue.
	£	£	£	£	£	£	£
1855 - - - -	2,610,949	105,471	2,716,420	93,000	2,809,420	2,408,052	401,368
1856 - - -	2,764,606	103,348	2,867,954	168,000	3,035,954	2,432,094	603,860
1857 - - - -	2,928,858	106,855	3,035,713	160,000	3,195,713	2,564,933	630,780
1858 - - - -	2,975,939	111,596	3,087,535	154,000	3,241,535	2,889,166	352,369
1859 - - - -	3,197,258	116,417	3,313,675	148,249	3,461,924	2,900,470	561,454
1860 - - -	3,267,662	121,693	3,389,355	141,810	3,531,165	2,823,186	707,979
1861 - - - -	3,402,691	127,866	3,530,557	134,571	3,665,128	3,154,527	510,601
1862 - - - -	3,496,635	136,954	3,633,589	130,415	3,764,004	2,926,551	837,453
1863 - - - -	3,730,073	144,226	3,874,299	125,156	3,999,455	2,956,486	1,042,969
1864 - - - -	3,957,047	151,979	4,109,026	122,532	4,231,558	3,072,235	1,159,323
Average Net Revenue of first Five Years - - - - - - - - - -						— £	509,966
Ditto second ditto - - - - - - - - -						— £	851,665

The following Statement shows the receipt and disposal of monies on account of Post Office Savings Banks, and the charges of management thereof, which are not included in the charges of management of the Post Office:—

RETURN of the Sums due to all Depositors in Post Office Savings Banks throughout the United Kingdom on the 31st March 1865; of the Expenses of Management of the Post Office Savings Banks to the same Date; of the Amount standing to the Credit of the Post Office Savings Banks, on the same Date, in the Books of the Commissioners for the Reduction of the National Debt; of the Balance in the Hands of the Postmaster-General at the same Date; and of the Amount of any Loss sustained by the Post Office Savings Banks from Frauds committed in the Transmission of Deposits, or otherwise.

LIABILITIES.

	£ s. d.	£ s. d.
Total amount of deposits, from 16th September 1861 to 31st March 1865, of the interest allowed and added to principal on 31st December 1861, 31st December 1862, 31st December 1863, and 31st December 1864, and of the interest allowed and paid on closed accounts up to 31st March 1865 - - - - - -	9,217,809 8 7	
Deduct— Repayments to depositors, from 16th September 1861 to 31st March 1865 - - - - - -	3,851,883 14 6	
Total sum due to all depositors in the Post Office Savings Banks in the United Kingdom on the 31st March 1865 - - - - - -		5,365,925 14 1
Surplus of assets over liabilities - - - - - -		41,000 2 1
		£ 5,406,925 16 2

ASSETS.

	£ s. d.	£ s. d.	£ s. d.
Total amount of the sums paid by the Postmaster General to the National Debt Commissioners for investment, and of the interest received on such investments, from 16th September 1861 to 31st March 1865 - - - - - - - -	- - -	5,487,728 6 10	
Deduct— Amount which has been repaid by the Commissioners for the Reduction of the National Debt, on account of 103,506*l.* 12*s.* 11*d.*,* being the amount paid for the expenses of management of the Post Office Savings Banks from 16th September 1861 to 31st March 1865 - -	91,848 7 4		
Amount of sums transferred from Post Office Savings Banks to Savings Banks - - - - - -	5,255 19 5		
		97,104 6 9	
Balance remaining in the hands of the Postmaster General to be paid over for investment - - -	- - -	29,147 15 9	5,390,624 0
Deduct— Amount of loss through the defalcations of a former postmaster of Beverley - - - -	1,093 14 1		
Amount of loss by the frauds committed by J. W. Thorne - -	94 0 0		
Amount of expenses of management paid by the Postmaster-General during the quarter ended 31st March 1865; not recovered from the Post Office Savings Bank Fund at that date - - - - - -	11,658 5 7		
		12,845 19 8	
			16,301 16 1
		£	5,406,925 16 2

* According to the Parliamentary Paper No. 523, 1861, it was estimated that the cost of each transaction would be 7*d.* The actual average cost of each transaction has been 6¼*d.*

Improvements under consideration at the Close of 1864.

At the close of 1864 a measure for the alteration of the scale of postage on Inland Letters, from a progression by one ounce and the charge for one ounce at each step after the first ounce of weight, to a progression by half an ounce and the charge for half an ounce at each step, was in contemplation.

A measure for giving additional facilities for the late posting of letters for the Night Mails out of London, at the General Post Office, and at the District offices, was also under consideration.

Some progress had been made in the introduction of the District system into Liverpool, and various plans for the increase of postal accommodation in that town were under consideration.

The regulations for giving effect to the provisions of the Government Insurances and Annuities Act were in course of preparation.

The effect of the measures thus adverted to will be described in the Report for the year 1865.

I have the honour to be,
My Lords,
Your Lordships' obedient Servant,
STANLEY OF ALDERLEY.

LONDON:
Printed by George E. Eyre and William Spottiswoode,
Printers to the Queen's most Excellent Majesty.
For Her Majesty's Stationery Office.

THE

TWENTY-SIXTH ANNUAL REPORT

OF THE

DEPUTY KEEPER

OF THE

PUBLIC RECORDS.

[18 February 1865.]

Presented to both Houses of Parliament by Command of Her Majesty.

REFORM CLUB
PALL MALL

LONDON:
PRINTED BY GEORGE E. EYRE AND WILLIAM SPOTTISWOODE,
PRINTERS TO THE QUEEN'S MOST EXCELLENT MAJESTY.
FOR HER MAJESTY'S STATIONERY OFFICE.

1865.

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THE TWENTY-SIXTH REPORT

OF

THE DEPUTY KEEPER OF THE PUBLIC RECORDS.

TO THE QUEEN'S MOST EXCELLENT MAJESTY.

MAY IT PLEASE YOUR MAJESTY,

IT is my duty to present to Your Majesty the Annual Report of the proceedings in the Public Record Office, for the year 1864.

The current business of the Department consists of the following distinct branches:—

Keeping Safely and Arranging the National Archives;

Making Calendars, Inventories, Catalogues, &c., of the Public Muniments;

Producing Records and Documents to Inquirers for Legal, Personal, Historical, or other Information; to Public Officers for Government purposes; and—

Affording such information to Your Majesty's Government as can be obtained from the Public Records.

I. FEES.

In my last Report I had the honour to bring before Your Majesty the subject of the payment of Fees for consulting the Public Records, with a view of placing all applicants, whether for Legal or Literary purposes, on the same footing, by allowing to them the gratuitous use of the Records and Calendars, with full power to copy such as they might require. I again venture to call attention to the subject. During the year 1864, 3,791 persons transacted business in the Legal Search Office, and paid 700*l.* 19*s.* 6*d.* in Fees, as will appear from the following Table:—

Searches.	—	Inspections.	—	Authenticated Copies.	—	Attendances.	—	Amount of Fees in 1864.	Total Amount of Fees paid into the Exchequer since 1840.
	£ s. d.		£ s. d.		£ s. d.		£ s. d.	£ s. d.	£ s. d.
1,265	63 5 0	3,499	108 11 0	847	464 0 6	50	65 3 0	700 19 6	20,531 15 3

To the foregoing must be added, the Searches and Inspections of Literary Inquirers; the business on behalf of Government Departments; the operations of the Commissioners of Patents; and the Attendances on Foreclosures of Mortgages; for none of which Fees are paid.

II. LITERARY INQUIRIES.

On the subject of the Literary Searchers, I would remark that, since the 1st January 1852, Inquirers have been permitted, on obtaining a card of admission from the Deputy Keeper, to consult the Records for literary, historical, antiquarian, genealogical, topographical, and similar purposes, without payment of Fees. These searches are frequently of long continuance, and appear to be of the same character as those in the British Museum. There has been during the past year a marked increase in Historical investigations. The business caused by such Inquiries is in addition to the details given in the previous section (I.), and for the year 1864 is as follows:—

Number of Literary Inquirers.	Number of Attendances.	Number of Documents used.
167 (of whom 83 were new Applications, and 22 were renewed).	2,948	13,424 (exclusive of Calendars, Catalogues, Repertories, Inventories, Indexes, and Printed Books of Reference).

Searches have been completed by one of the Record Officers relative to the History of Prices in England during the Middle Ages, mentioned in the Twenty-fifth Report (§ II.), for the Rev. J. E. T. Rogers, Professor of Political Economy at Oxford. The Officer was occupied 322 whole days, and parts of 43 days, from 20 November 1862 to 11 November 1864. He made extracts from 1,913 Accounts, and searched the Pipe Rolls, Foreign Accounts, Household and Wardrobe Accounts, Ministers' Accounts, &c., from Henry II. to Edward III., for the Prices of Grain, Labour, Metals, Food, Cattle, Tar, Lime, Articles of Husbandry, Canvass, Fruit, Cider, Beer, &c.

The total number of Literary Inquirers from 1 January 1852 (when they were first admitted without payment of Fees) to 31 December 1864 is 1,575; their Attendances have been 20,873, and the number of Documents which they consulted was 141,723 (exclusive of Calendars, Catalogues, Repertories, Inventories, Indexes, and Printed Books of Reference).

I had the honour to submit to Your Majesty in my Twenty-third, Twenty-fourth, and Twenty-fifth Reports, Lists of the subjects for which the Records have been consulted by Literary

Inquirers, from 1852 to 1863, and I beg leave to add a similar List for 1864 :—

SUBJECTS OF RESEARCH BY LITERARY INQUIRERS IN THE PUBLIC RECORD OFFICE, 1864.

History of England during the reign of Elizabeth.—History of Kent.—Researches relating to Windsor.—Genealogical and Antiquarian purposes.—Family History.—Early History of the Parish of Woodland, Dorset.—History of the Royal Library of the Kings of England.—The connexion of the Royal Prerogative with the Art of Printing.—Early History of the Post Offices of the United Kingdom.—To inspect State Papers relating to Ireland, of the reign of Queen Anne.—History of Kent.—Inquiries on the subject of Writs of Habeas Corpus.—Genealogical and Historical purposes.—To make extracts from Colonial Papers (1729–1776) bearing on the early History of North Carolina.—Genealogical and Topographical purposes.—History of Belgium.—Family History.—Researches relating to the Rectory of Kirk-heaton, Yorkshire.—History of France.—Early English Literature.—To consult Documents of the time of the Commonwealth.—Early English Literature.—History of the 43rd Regiment.—Topography of London.—Family History.—Scottish History.—Family History.—History of the Church in Ireland.—Historical Lectures.—Family Biography.—Researches connected with Family History and the County of Norfolk.—History of the Isle of Wight.—History of the Church in Ireland.—Historical and Genealogical Researches.—To inspect Colonial Papers relative to Property left in the Island of Tobago, about 1794.—Literary Research.—History of Lincolnshire.—Family History.—Ecclesiastical matters in Wales.—Literary and Genealogical purposes.—Topographical and Genealogical Researches.—Family Biography.—Literary and Antiquarian Researches.—History of the Border Counties.—History of Lincolnshire.—History of Hampshire.—Early Family History.—To examine Domestic Papers, Charles I.—History of Limerick.—History of Arabella Stewart.—To verify a signature of John Knox.—Topographical Research in Cornwall.—History of Her Majesty's Mails, &c.—History of the Harley Family.—To inspect, &c., Domestic Papers respecting a Transport which conveyed Recruits to North America, June 1782.—Topography and Genealogy of Norfolk.—History of the Parish of Fincham, Norfolk.—Genealogical Research.—Lives of the Lord Mayors.—Antiquarian and Literary Research.—To inspect the Extent of Jersey, 1331, and to make a tracing therefrom of a name.—To examine Royal Letters, Hen. III.—Information relating to the Parish of Holyhead.—History of the Family of Pomeroy, of Berry Pomeroy.—Researches relating to the History of the Navy.—History of the early Earls of Lennox.—Historical Research.—Researches relative to the French Protestant Refugees.—Historical Research.—History of the Uvedale Family.—To consult the Royal Letters.—Historical Research.—Family Biography.—To inspect the Secretary's Letter Books and portions of Foreign Correspondence, Anne & Geo. I.—Antiquities of Lincolnshire.—Subjects connected with the Civil Wars, 1642–1660.—History of Commerce.—Historical and Genealogical Researches.—To take extracts, &c., from Foreign Correspondence relating to the History of France, during the 16th and 17th Centuries.—History of Lincolnshire Families.—Family Genealogy.—History of Borough of Portsmouth.—History of the Horsey Family.—Researches relating to the New River.—History, Antiquities, and Genealogies of Norfolk.—History of the reign of Queen Anne.—To trace the pedigree of Mr. Maudslay, the Engineer.—Literary Research.—

Literary Research.—To copy a letter from Sir Charles Hanbury Williams 1753.—Literary Research.—History of County Families in the North of England.—History of the Family of Vaughan.—History of County of Glamorgan ; and general Literary purposes.—To examine a Charter of King Stephen.—History of Kett's Rebellion.—History of the Midland Districts.—All Letters or Documents relating to the Family of Barnardiston.—To copy, &c., a letter from Simon Bustall to his wife. 1 Nov. 1716, among the Board of Trade Papers.—History of the Castle, Parish, and Manor of Amberley, Sussex.—Genealogical Researches.—Historical and Military Researches, from the reign of Queen Elizabeth.—Life of Buchanan.—Researches relating to Warwickshire.—Family Researches, in the County of Kent, &c.—Literary purposes.—To consult the Baga de Secretis, &c. —Pedigree of the Gregory Family.—Literary Researches. —History of Monasteries.

III. BUSINESS CONNECTED WITH GOVERNMENT DEPARTMENTS.

In the year 1864, 250 applications were made by Government Officers for information connected with their several Departments, as follows:—

NUMBER of SEARCHES, INSPECTIONS, ISSUES, and RETURNS of GOVERNMENT PAPERS, for GOVERNMENT DEPARTMENTS, in 1864.

Department.	Number of Searches or Applications.	Number of Inspections, Issues, Returns, &c.
Treasury	4	165
Treasury Solicitor	4	5
War Office	199	3,307
Admiralty	38	286
Audit Office	4	62
Exchequer (Comptroller-General)	1	16
	250	3,841

In addition, 154 Rolls were produced to the Officers of the Commissioners of Patents, from which they took copies of specifications and plans. (*See* Twenty-fifth Report, § I.)

The particulars of the business connected with Attendances on Foreclosures of Mortgages in the Rolls Chapel Office, in 1864, are as follow (in continuation of the account in the Twenty-fifth Report, § I.):—

Number of cases where Attendance was given, and the money paid:—

Attendances, 3. Money paid, 2,412*l.* 13*s.* 5*d.*

Number of cases where Attendance was given to receive, but no one attended to pay:—

Attendances, 44. Money unpaid, 144,117*l.* 11*s.* 9*d.*

Total of Attendances - - 47

Total of Money - - 146,530*l.* 5*s.* 2*d.*

In my Twenty-fifth Report to Your Majesty (§ V.), I stated the progress made by the Committee appointed to examine the Government Documents in the Public Record Office during the year 1863; and I mentioned that the proposal of the Master of the Rolls for the Committee to report next upon the Records of the Treasury Solicitor was under consideration by the Lords of Your Majesty's Treasury. The Committee resumed its labours on 2 February 1864, and made a Report upon the Treasury Solicitor's Records on 18 April 1864. The Master of the Rolls, in his letter to the Treasury, 21 April 1864, approved generally of the recommendations of the Committee, and suggested that the Documents might be thrown open to the Public to the end of the reign of George III. (1820) in the same manner as other Treasury Papers; and that the year 1820 might be advantageously selected for making a division between the Documents to be retained by the Treasury Solicitor, and those to be preserved in the Public Record Office. He also proposed that the Committee should next report upon the Documents from the Office of the Commissioners for Auditing the Public Accounts. In reply, their Lordships, 11 August 1864, thought that a different rule should be applied as regarded the admission of the Public to the Treasury Solicitor's Records from that which had been adopted with respect to other Treasury Records, and that all applications from persons seeking access to such Papers should be referred to the Solicitor of the Treasury. With reference to making the year 1820 the period for dividing the Papers, their Lordships were of opinion that no re-transfer should take place to the Treasury Solicitor, but that, looking to the scanty accommodation provided for the storing of Papers in the Treasury Solicitor's Department, a periodical removal of such Papers to the Public Record Office, for preservation, as might be approved, should take place.

The particulars of some re-transfers of Documents arising out of the above-mentioned Report, and of a former Report of the Committee, are afterwards mentioned (§ IV.).

The Committee commenced their sittings on the Documents of the Audit Office, 26 May 1864, but have not made their Report.

IV. REMOVALS OF RECORDS TO AND FROM THE PUBLIC RECORD OFFICE.

The annual transfers of the Accruing Chancery Records have taken place, of which the particulars are given in a following section (§ X.).

The transfer of the Records of the High Court of Admiralty, from the Office of the Registrar, mentioned in the Twenty-fifth Report (§ III.), has also been completed (§ X.).

Your Majesty's Secretary of State for the Home Department having requested that the Papers in the hands of the Secretary to the late Public Schools' Commission might be deposited in this Office, arrangements have been made for their reception (§ X.).

Your Majesty's Secretary of State for the Colonial Department has transferred to this Office various Papers and Documents relating to the British Government of the Ionian Islands, sent to this country on the relinquishment by Your Majesty of Your Protectorate over the United States of the Ionian Islands. The Documents relate to Corfu, Cefalonia, Cerigo, and Paxo (including the Parga Papers); those relating to Zante, St. Maura, and Ithaca have not yet been received. They consist of Correspondence, Colonial Despatches, Petitions to the Lord High Commissioner, Consuls' Letters, Proceedings of the Senate and Legislative Assembly, Financial Statements, Registers and Certificates of Births, Marriages, and Deaths, Letter Books, Gazettes, &c. Further particulars are hereafter given (§ X.).

From the War Office have been received, on the application of Your Majesty's Secretary of State for War, various Commissariat Records, relating to the Troops under the Duke of York and Lord Moira, 1793–1797; and under Sir Ralph Abercrombie, 1799–1806; to the Walcheren Expedition, 1809–10; to the Irish Famine; the Crimean War; &c. (§ X.).

The Discharge Documents of Soldiers who quitted the Army by Purchase, &c., during 1862, as well as the Regimental Pay Lists for 1855-6, 1856–7, and 1857–8 (§ X.), have also been received, in continuation of series already in this Office.

In the Twenty-fourth Report (§ V.) it is stated that the Committee appointed to examine the Documents in the Public Record Office belonging to Government Departments, had reported on the Treasury Records. Among these Documents were certain Books relating to the Establishments of Officers in Your Majesty's Customs, a portion of which had been received from the Custom House in 1848 and 1851. The Lords Commissioners of Your Majesty's Treasury, 20th November 1862, in deciding upon the course to be adopted with the various classes, requested that the Customs' Establishment Books, either English, Scotch, or American, might be placed at the disposal of the Commissioners of Customs, who were desirous of obtaining a portion for the Library and Museum of their Department. After communications with the Board of Customs, the Establishments' Books hereafter mentioned (§ X.) were delivered to the Commissioners of Customs, for the purpose of being deposited in the Customs' Library and Museum.

The Committee on Government Documents, in like manner, have reported on the Records of the Treasury Solicitor (§ III.). Among these Documents was a large mass of Papers connected with the operations of the "Church Building Commissioners" appointed under the Act 58 Geo. III. c. 45, whose functions continued until 1 January 1857, when the Commission expired, and its powers vested in the Ecclesiastical Commissioners for England. The principal duties of the Church Building Commissioners were to promote church extension and make grants in aid thereof, to divide parishes into ecclesiastical districts, to accept conveyances of sites for churches, chapels, churchyards, parsonages, &c., for which purpose One Million Pounds was voted. During the continuance

of the Church Building Commission, the legal business was conducted by the Treasury Solicitor; since its expiration, by the Solicitors to the Ecclesiastical Commission. The Lords Commissioners of Your Majesty's Treasury therefore requested that the portion of the Report of the Committee on Government Documents relating to these Papers might be transmitted to the Ecclesiastical Commissioners for England, and those Commissioners consequently have expressed a desire that the Papers in question should be transferred to them, to be added to a number of a similar description previously received by them from the Treasury: directions have accordingly been given for their delivery.

Transfers to this Department of Militia and other Accounts, and of Miscellaneous Documents, have also been requested by the War Office, but have not been carried into execution, from want of space to receive them until the erection of the portion of the new wing of the Record Repository now being built (§ IX.). A further transfer of early Chancery Affidavit Books, from the Clerks of Records and Writs, is also standing over for the same reason.

V. DOMESDAY BOOK.

In my Twenty-fifth Report (§ IV.) is submitted to Your Majesty a statement relative to the completion, under the direction of Colonel Sir Henry James, R.E., at the Ordnance Survey Office, Southampton, of the fac-similes for sale, by Photozincography, of Domesday Book. I mentioned that Domesday Book had been taken to Southampton, and remained there during portions of three years, under the charge of an Assistant Keeper, whose reports on this subject have been submitted to Your Majesty. That the Photozincography might be properly carried on, it became necessary to remove from the two Volumes of Domesday Book the unsuitable covers in which they were bound during the last century, in order to submit each leaf separately to the process. On the operations being finished, and the two volumes of Domesday Book restored to this Office, it became requisite to re-bind them. The Master of the Rolls therefore suggested to the Treasury (8 March 1864), that the future binding of Domesday Book should be of a description worthy of its priceless character and of the Nation to which it belongs, and that the Department of Science and Art should be officially requested to furnish a fitting design for his approval. To which letter the Lords Commissioners of Your Treasury (7 April 1864) replied, that they had readily invited the co-operation of the Department of Science and Art, in causing a design to be made for the re-binding of Domesday Book, suitable to its period and to the great interest attached to it, and had requested that Department to communicate with the Master of the Rolls on the subject. The Lord President of the Council was therefore asked to authorize the preparation of a suitable design for the binding of Domesday Book by an Artist employed at the South

Kensington Museum: such a work to be of the highest style of Art, worthy of the unique volume for which it is to be used. The design has been confided by the Lord President to Mr. Godfrey Sykes (Decorative Artist of the South Kensington Museum), who is engaged in the necessary inquiries about enamelling and other processes which it may be expedient to adopt, and which will necessarily influence the character of the design. It is hoped that the work will be put in hand in the course of the year 1865.

VI. FAC-SIMILES OF NATIONAL MANUSCRIPTS, BY PROCESS OF PHOTOZINCOGRAPHY.

The accomplishment of the fac-similes of Domesday Book by Photozincography, as stated in the previous section (V.), induced Colonel Sir Henry James to propose to the Lords Commissioners of Your Majesty's Treasury that the same process should be applied to the reproduction and perpetuation of some of the National Records. The subject was referred to the Master of the Rolls, and he informed the Treasury that a very curious volume, or even volumes, might be made of selections from the numerous series of Records, if subjected to Sir Henry James' process; that it would, however, be necessary to add a few words explanatory of each specimen; and that the volume should then be published for sale under the direction of the Master of the Rolls. The Treasury in reply (21 March 1864), informed the Master of the Rolls that their Lordships concurred with him in thinking that such a volume of fac-similes, consisting of Documents of the very first rank in point of national interest, might be prepared; that there should be a short explanation of each specimen, and a translation into modern language of those in Latin and French; that they readily placed the matter in his hands, and had requested the Secretary of State for War to give the necessary instructions to Sir Henry James.

In conformity with these arrangements, Mr. Sanders, an Assistant Keeper of Records, who had formerly been at Southampton with Domesday Book, proceeded again to the Ordnance Survey Office there, 21 April 1864, taking with him certain selected Records to be subjected to the process of Photozincography. The Corporation of the City of London likewise lent their two Anglo-Saxon Charters granted by William the Conqueror, and the Dean and Chapter of Lincoln permitted their copy of Magna Carta to be added to the fac-similes. A list of Documents to be published in the first part will be found in the Appendix (No. 5). The Report of the Assistant Keeper, stating the progress made in the work, is as follows:—

Ordnance Survey Office, Southampton,
9 January 1865.

SIR,

I HAVE the honour of submitting to you the following Report upon the work I have been engaged in during the past year.

Acting under your instructions, I received into my charge the series of Records which had been selected by yourself and approved of by his

Honour the Master of the Rolls, and deposited them in this Office on Thursday the 21st of April, for the purpose of carrying into effect the Orders of Her Majesty's Government to have fac-similes thereof made by Photozincography.

The mode adopted for copying them being nearly identical with that employed in the reproduction of Domesday Book,—an account of which I have already given in my Reports of 1862–3,—it will be unnecessary for me to repeat the explanation of it here. The operation however was rendered longer and more difficult by the fact of the originals varying so much in size that a fresh focussing of the Cameras was necessary in each case, and consequently fewer negatives could be taken in a day than was the case with Domesday Book, where one focus was sufficient for the whole Volume, but the summer proving very favourable, especially at its close, for photography, we had obtained negatives of the entire series, amounting to 590 in number, by the end of October.

In order to reduce the work to a convenient size for reading, and at the same time to be enabled to furnish it to the public at a reasonable price, it has been resolved to publish it in parts, the first of which will consist of specimens of each reign from William the Conqueror to Henry VII., inclusive; and the preliminary operations having been gone through, chromo-carbon prints of that portion were prepared and transferred to the zinc plates.

Many of the original Records are in such good condition as to render the chromo-carbon printing an easy task, but in others the contrary is the case. Wherever the solution of galls had been used, a corresponding blotch of ink was the result on the chromo-carbon print, to do away with which, and obtain a fac-simile of the original as it was before having been defaced by this pernicious liquid, was an operation requiring great care and patience, and productive of many disappointments. For instance, the Charter granted to the City of London and that to Deorman by William the Conqueror, which were brought down here from the Town Clerk's Office on the 31st of May, although in good preservation, repeatedly baffled all endeavours at copying them, owing to the dark colour of the parchment and the consequent faint contrast between it and the ink, but, by employing a particular process which suggested itself to me, the difficulty was at length overcome both in these cases and others of a like kind that successively occurred. The worst case of all however, and the only one that almost made me despair, was the Lincoln copy of Magna Carta, which was delivered into my custody by Mr. Roberts on the 6th of July. The writing is as clear and distinct as it was on the day it was written, and the instrument has been subjected to no destructive agents, and has suffered little from the effects of time, but it is crossed and recrossed by creases made by the folds in which it lay probably for centuries, and which will now, I am afraid, disfigure it as long as it lasts. No pains were spared to do away with the effects of these; the original I did not of course attempt to restore, but we tried taking photographs of it in two portions—in four—in slips both lengthwise and across, endeavoured to piece in the broken lines, and employed every means that we could think of, in vain, owing to the expansion and contraction of the paper being too uneven for the nicety required. Failing in this after repeated trials, I determined to get a copy, slightly reduced in size, on a single plate, and print it with all its defects exactly as the original exists at the present date. The result, though not so fair to the eye as an unblemished picture would have been, has the merit of showing the actual condition of the Great Charter 650 years after it was written; and in order to exhibit what, if any, deterioration has taken place in its condition during the last

50 years, I have given a copy of the engraved fac-simile made by order of the Record Commissioners in 1819. In comparing the two, however, it must be borne in mind that the hand-facsimilist has studied to conceal the defects which the Photozincograph so faithfully records, and that in instances of this particular kind he has an advantage over the photographer in being able, however stubborn the creases, to smooth out the words as they come under his pen letter by letter. A third Photozincograph of the Charter is also added in a greatly reduced size, as an example of the fidelity of a copy made by Photozincography, even on a scale so small as to require a magnifying lens to distinguish the letters.

Three of the documents only, of those selected, have been omitted. Of these it has been considered useless to attempt getting a copy of the Charter of Alfonso, King of Castille, conferring the order of knighthood on Prince Edward in 1254, on account of its faded condition; and the writing of the two others—Pope Clement VII.'s Golden Bull of 1523, confirming the Title of Defender of the Faith conferred upon Henry VIII. by Leo X., and the Treaty between Henry VIII. and Francis I. of France in 1527,—is almost invisible from the coating of goldbeater's skin which has been laid over the surface with a view to preserve it. These two cannot be satisfactorily reproduced by Photozincography without having this protection removed, which could, perhaps, not be accomplished without risk. The Golden Seal of Castille and the Golden Bull have been both modelled in gutta percha and electrotyped in copper, and the splendid Seal of Francis I. has been engraved and printed on the title-page of the volume of fac-similes.

With these exceptions the whole series has been photographed, and Part I. transferred to the zinc plates. The number of copies to be published has been fixed at 500, which are in process of being struck off.

As soon as the Photographing was over, and the revision of the first proofs completed, I began the translations for Part I., all of which are now finished, and are being printed by the Queen's printers, page for page with the fac-similes, so that the latter may be the more easily read by their aid, and reference to them encouraged and facilitated.

This portion of the work will now, therefore, be shortly ready for publication; and, as soon as this is the case, Part II., which it is proposed shall comprise the reigns of Henry VIII. and Edward VI., and contain about the same number of pages as Part I., will be taken in hand and brought out without delay.

In July, Sir William Gibson Craig, the Lord Clerk Register of Scotland, came here in consequence of an arrangement entered into with Her Majesty's Government for copying a selection from the Scottish Records in his custody in connection with those to be published under the sanction and by the authority of the Master of the Rolls. I had the pleasure of being introduced to Sir William Craig by Sir Henry James, and gave him all the information in my power concerning the plan adopted for bringing out the English series, and in October his visit was followed by one from Mr. Robertson, the Chief Clerk of the Register House in Edinburgh, with whom I had a long conference on the same subject, the result of which was, that, subject to your approval, the Scottish Records in question should be made over to my charge during the present spring.

Both Sir William Craig and Mr. Robertson expressed their concurrence in our plan, with the exception of preferring a larger sized page than that which had been decided upon as more easily readable and better adapted for the purpose of sale.

I hope that what I have endeavoured to explain as having been done will obtain the approbation of the Master of the Rolls, and further his wishes to render the knowledge of the invaluable National Records in his custody a useful and popular study.

I have only in conclusion to acknowledge that the ability and perseverance of those appointed by Sir Henry James to assist in carrying out the directions of the Government have been worthy of the high reputation of the establishment under his direction.

I have the honour to be,
Sir,
Your obedient Servant,
(Signed) WILLIAM BASEVI SANDERS,
Assistant Keeper of H. M. Records.

To the Deputy Keeper of the Public Records.

VII. CALENDARS.

In my previous Reports, I have submitted to Your Majesty observations on the necessity of formation of accurate Calendars to the National Records, and on the progress which has been made.

In my Twenty-fifth Report (§ VI.), I stated that in order more effectually to prosecute the compilation of Calendars, a distinct Department had been formed in this Office, and submitted to Your Majesty a notice of the proceedings during the year 1863. In sections XIII. and XIV. of the present Report will be found a statement of the progress of such Calendars, &c., for 1864, as well as (App. No. 7) a list of the Calendars and Indexes that have been placed in the Search Room for the convenience and use of the public, so far as the Documents are open, in addition to the List in the Twenty-fifth Report (App. No. 5). Among these are the following, which I append to the present Report in order that they may be made more extensively known and useful:—

App. No. 1. A List of Plans annexed to Deeds enrolled for safe custody, and to Awards of Commissioners for Inclosing Common and other Lands enrolled pursuant to Acts of Parliament for the Inclosure of Lands, for the reigns of Geo. III. and Geo. IV. (a similar List for the reign of Will. IV. being in progress); and a List of Plans annexed to Inclosure Awards only, from 31 Geo. II., 1757, to 7 Will. IV., 1837.

App. No. 2. A Calendar of all the Warrants, Signed Bills, and Privy Seals for the counties of Chester and Flint, removed from Chester to this Office in 1854, being principally for the reigns of Hen. VII. and Hen. VIII.

App. No. 3. A Calendar of all the Writs of General Livery, Ouster le Main, &c., for the county of Chester, also brought from Chester to this Office in 1854, for the reigns of Eliz., James I., and Charles I.

App. No. 4. A Calendar of Deeds, Inquisitions, and Writs of Dower on the Chester Plea Rolls, for the reigns of Hen. III. and Edw. I.

Among the Record Works printed by Your Majesty's late Commissioners on the Public Records, is a volume entitled, "Rotuli

"Litterarum Patentium in Turri Londinensi asservati, A.D. 1201–1216"; which is a verbatim et literatim copy in print of the original Patent Rolls of the reign of King John. None of the Public Records so vividly illustrate the history, government, and policy of this country, as the invaluable series of the Patent Rolls of the High Court of Chancery. It has been a matter of deep regret that the publication of these most important Records should not be continued on the plan commenced. But as Your Majesty's Government decided (principally, as it is believed, for financial reasons) not to continue the publication in that form, a Calendar of the Patent Rolls has since been continued in this Office, and is now nearly completed for the reign of Henry III. As a specimen of such Calendar, and in order to enable Your Majesty's Treasury to form an opinion of its value (should a proposition to print it be hereafter made), I append to this Report (App. No. 6) the Calendar for the first year of the reign of Henry III.

The Master of the Rolls forwarded to Your Majesty's Treasury, 27 November 1863, a proposal by Mr. Roberts to revise, for publication and sale, a Calendar of Heirs, extracted from the Inquisitions for the reigns of Henry III. and Edward I., and their Lordships, having assented thereto, decided that the title of the work should be "Calendarium Genealogicum." The Calendar is nearly completed at press.

For the Calendars which have been printed for sale (copies of which have also been placed in the Search Room for the use of the public) there is a steady demand. Thirty volumes have been published, and the total number sold has been 3,242. A full description of these Calendars has been given in my previous Reports. They are widely consulted on points relating to history, biography, ecclesiastical, naval, and military affairs, topography, genealogy, trade, commerce, manufactures, &c. During the year 1864 the following volumes have been published, in continuation of former works in the series, the last mentioned, however, being the commencement of the inquiries into the Venetian Archives:—

Calendar of Letters and Papers, Foreign and Domestic, of the Reign of Henry VIII., preserved in the Public Record Office, the British Museum, &c. *Edited by* J. S. Brewer, M.A., Professor of English Literature, King's College, London. Vol. II. (in Two Parts)—1515–1518.

Calendar of State Papers, Domestic Series, of the Reign of Charles I., preserved in Her Majesty's Public Record Office. *Edited by* John Bruce, Esq., F.S.A. Vol. VII.—1634–1635.

Calendar of State Papers, Domestic Series, of the Reign of Charles II., preserved in Her Majesty's Public Record Office. *Edited by* Mary Anne Everett Green. Vol. V.—1665-1666.

Calendar of State Papers and Manuscripts, relating to English Affairs, preserved in the Archives of Venice, &c. *Edited by* Rawdon Brown, Esq. Vol. I.—1202–1509.

In my Twenty-fifth Report (§ VI.) is given an account of the principal events mentioned in the above-mentioned Calendars edited by the Rev. J. S. Brewer, Mr. Bruce, and Mr. Rawdon Brown. The work edited by Mrs. Green is in continuation of

former volumes, and embraces the same description of documents, principally relating to naval affairs, but containing also many papers relating to the rising in Scotland in 1666, the great fire of London, &c.

The under-mentioned volumes are in the press, or in preparation for printing, in continuation of former works:—

Calendar of State Papers relating to Ireland, preserved in Her Majesty's Public Record Office. *Edited by* Hans Claude Hamilton, Esq., F.S.A. Vol. II.—1574–1585.

Calendar of State Papers, Domestic Series, of the Reign of Elizabeth (continued), preserved in Her Majesty's Public Record Office. *Edited by* Robert Lemon, Esq., F.S.A. 1581–1590.

Calendar of State Papers, Foreign Series, of the Reign of Elizabeth, preserved in Her Majesty's Public Record Office, &c. *Edited by* the Rev. Joseph Stevenson, M.A., of University College, Durham. Vol. II.—1559–1560.

Calendar of State Papers, Domestic Series, of the Reign of Charles I., preserved in Her Majesty's Public Record Office. *Edited by* John Bruce, Esq., F.S.A. Vol. VIII.—1635.

Calendar of Letters and Papers, Foreign and Domestic, of the Reign of Henry VIII., preserved in Her Majesty's Public Record Office, the British Museum, &c. *Edited by* J. S. Brewer, M.A., Professor of English Literature, King's College, London. Vol. III.—1519, &c.

Calendar of State Papers, Domestic Series, of the Reign of Charles II., preserved in Her Majesty's Public Record Office. *Edited by* Mary Anne Everett Green. Vol. VI.—1666–1667.

Calendar of Letters, Despatches, and State Papers, relating to the Negotiations between England and Spain, preserved in the Archives at Simancas, and elsewhere. *Edited by* G. A. Bergenroth. Vol. II.—Henry VIII.

Calendar of State Papers, Colonial Series, preserved in Her Majesty's Public Record Office, and elsewhere. *Edited by* W. Noël Sainsbury, Esq. Vol. III.—East Indies, China, and Japan.

Calendar of State Papers and Manuscripts, relating to English Affairs, preserved in the Archives of Venice, &c. *Edited by* Rawdon Brown, Esq. Vol. II.—Henry VIII.

VIII. CHRONICLES AND MEMORIALS OF GREAT BRITAIN AND IRELAND DURING THE MIDDLE AGES.

Of this valuable contribution to History, 57 volumes have been published, relating to the Three Kingdoms, many of them taken from unique manuscripts. The chief design in selecting these works has been to fill up existing blanks in British History. 13,735 volumes have been sold to the end of the year 1864. The following were the volumes issued in 1864:—

Letters and Papers illustrative of the Wars of the English in France during the Reign of Henry the Sixth, King of England. Vol. II. (in Two Parts). *Edited by* the Rev. Joseph Stevenson, M.A., of University College, Durham.

The Saint Alban's Chronicles:—The English History of Thomas Walsingham, Monk of Saint Albans. Vol. II., 1381–1422. *Edited by* Henry Thomas Riley, Esq., M.A., Barrister-at-Law.

Year Books of the Reign of Edward the First. Years 32–33. *Edited and translated by* Alfred John Horwood, Esq., of the Middle Temple, Barrister-at-Law.

Leechdoms, Wortcunning, and Starcraft of early England; being a collection of Documents illustrating the History of Science in this Country before the Norman Conquest. Vol. I. *Collected and edited by* the Rev. T. Oswald Cockayne, M.A., of St. John's College, Cambridge.

Annales Monastici. Vol. I.:—Annales de Margan, 1066–1232; Annales de Theokesberia, 1066–1263; Annales de Burton, 1004–1263. *Edited by* Henry Richards Luard, M.A., Fellow and Assistant Tutor of Trinity College, and Registrary of the University, Cambridge.

Magna Vita S. Hugonis Episcopi Lincolniensis. From Manuscripts in the Bodleian Library, Oxford, and the Imperial Library, Paris. *Edited by* the Rev. James F. Dimock, M.A., Rector of Barnburgh, Yorkshire.

Chronicles and Memorials of the Reign of Richard the First. Vol. I. Itinerarium Peregrinorum et Gesta Regis Ricardi. *Edited by* William Stubbs, M.A., Vicar of Navestock, Essex, and Lambeth Librarian.

And the following Works are in the Press, and in progress:—

Le Livere de Reis de Brittanie. *Edited by* J. Glover, M.A., Vicar of Brading, Isle of Wight.

Recueil des Croniques et anchiennes Istories de la Grant Bretaigne a present nomme Engleterre, par Jehan de Waurin. *Edited by* William Hardy, Esq., F.S.A.

The Wars of the Danes in Ireland: written in the Irish language. *Edited by* the Rev. J. H. Todd, D.D., Librarian of the University of Dublin.

A Collection of Sagas and other Historical Documents relating to the Settlement and Descents of the Northmen on the British Isles. *Edited by* George W. Dasent, Esq., D.C.L. Oxon.

Polychronicon Ranulphi Higden, with Trevisa's Translation. *Edited by* Churchill Babington, B.D., Senior Fellow of St. John's College, Cambridge.

Official Correspondence of Thomas Bekynton, Secretary to Henry VI., with other Letters and Documents. *Edited by* the Rev. George Williams, B.D., Senior Fellow of King's College, Cambridge.

Royal and other Historical Letters illustrative of the Reign of Henry III., from the Originals in the Public Record Office. Vol. II. *Selected and edited by* the Rev. W. W. Shirley, D.D., Regius Professor in Ecclesiastical History, and Canon of Christ Church, Oxford.

Original Documents illustrative of Academical and Clerical Life and Studies at Oxford between the Reigns of Henry III. and Henry VII. *Edited by* the Rev. Henry Anstey, M.A.

Roll of the Privy Council of Ireland, 16 Richard II. *Edited by* the Rev. James Graves, A.B., Treasurer of St. Canice, Ireland.

RICARDI DE CIRENCESTRIA SPECULUM HISTORIALE DE GESTIS REGUM ANGLIÆ. Vol. II.—872–1066. *Edited by* JOHN E. B. MAYOR, M.A., Fellow and Assistant Tutor of St. John's College, and Librarian of the University, Cambridge.

THE WORKS OF GIRALDUS CAMBRENSIS. Vol. IV. *Edited by* J. S. BREWER, M.A., Professor of English Literature, King's College, London.

HISTORIA ET CARTULARIUM MONASTERII S. PETRI GLOUCESTRIÆ. Vol. II. *Edited by* W. H. HART, Esq., F.S.A.; Membre correspondant de la Société des Antiquaires de Normandie.

HISTORIA MINOR MATTHÆI PARIS. *Edited by* Sir FREDERICK MADDEN, K.H., Keeper of the Department of Manuscripts, British Museum.

ANNALES MONASTICI. Vol. II. *Edited by* HENRY RICHARDS LUARD, M.A., Fellow and Assistant Tutor of Trinity College, and Registrary of the University, Cambridge.

LEECHDOMS, WORTCUNNING, AND STARCRAFT OF EARLY ENGLAND; being a collection of Documents illustrating the History of Science in this Country before the Norman Conquest. Vol. II. *Collected and edited by* the Rev. T. OSWALD COCKAYNE, M.A., of St. John's College, Cambridge.

CHRONICON RADULPHI ABBATIS COGGESHALENSIS MAJUS; and, CHRONICON TERRÆ SANCTÆ ET DE CAPTIS A SALADINO HIEROSOLYMIS. *Edited by* the Rev. JOSEPH STEVENSON, M.A., of University College, Durham.

THE SAINT ALBAN'S CHRONICLES:—Vol. III. THE CHRONICLES OF RISHANGER, TROKELOWE, BLANEFORD, AND OTHERS. *Edited by* HENRY THOMAS RILEY, Esq., M.A., Barrister-at-Law.

CHRONICLES AND MEMORIALS OF THE REIGN OF RICHARD THE FIRST. Vol. II. *Edited by* WILLIAM STUBBS, M.A., Vicar of Navestock, Essex, and Lambeth Librarian.

DESCRIPTIVE CATALOGUE OF MANUSCRIPTS RELATING TO THE HISTORY OF GREAT BRITAIN AND IRELAND. Vol. II.—1066–1200. *By* T. DUFFUS HARDY, Esq., Deputy Keeper of the Public Records.

CHRONICA MONASTERII DE MELSA, AB ANNO 1150 USQUE AD ANNUM 1400. *Edited by* EDWARD AUGUSTUS BOND, Esq., Assistant Keeper in the Department of Manuscripts, and Egerton Librarian, British Museum.

DOCUMENTS RELATING TO ENGLAND AND SCOTLAND, FROM THE NORTHERN REGISTERS. *Edited by* the Rev. JAMES RAINE, M.A., of Durham University.

YEAR BOOKS OF THE REIGN OF EDWARD THE FIRST. 20th, 21st and 22nd Years. *Edited and translated by* ALFRED JOHN HORWOOD, Esq., of the Middle Temple, Barrister-at-Law.

WILLELMI MALMESBIRIENSIS DE GESTIS PONTIFICUM ANGLORUM, LIBRI V. *Edited by* N. E. S. A. HAMILTON, Esq., of the Department of Manuscripts, British Museum.

ITER BRITANNIARUM: THE PORTION OF THE ANTONINE ITINERARY OF THE ROMAN EMPIRE RELATING TO GREAT BRITAIN. *Edited by* WILLIAM HENRY BLACK, Esq., F.S.A.

IX. NEW BLOCK OF RECORD REPOSITORY.

In the Twenty-fifth Report (§ IX.) is submitted to Your Majesty an account of the progress made during the year 1863, in the erection of the new block of the Record Repository, so urgently needed. The works have continued uninterruptedly and steadily during 1864, though not so rapidly as anticipated. The internal walls are high enough to receive the iron girders for

the roof, and the stone façades are up to nearly the same level; the ribs for the iron roof of the Literary Search Room have been fixed; and it is hoped that the works will be finished by Midsummer 1865.

The internal fixtures and fittings have been contracted for, and the rooms are expected to be ready for their furniture by Michaelmas 1865.

On 25 April 1864, a Fire occurred in a small lodge used by the contractors for the new Building, burning down some workshops, rendering a large quantity of stone unserviceable, destroying many working plans, and damaging some of the fronts of the opposite houses. There was considerable danger to the Record Repository, Rolls House, and surrounding premises, but further extension was happily prevented by the exertions of the officer in charge, police, and firemen. The necessity of having a larger supply of water upon the Record Premises became more evident, and the subject was again brought before the Office of Works. The First Commissioner, 20 June 1864, replied that it would be expedient to complete the Tower of the original portion of the Record Repository (which has hitherto remained unfinished) in 1865, with the view of placing a large cistern upon it. He therefore wished to have the opinion of the Master of the Rolls, whether the Tower, as laid out in the last design of Mr. Pennethorne, the architect of the Record Repository, would provide a useful space for the deposit of Records. To which the Master of the Rolls replied, 27 June 1864, that the space in the Tower, not occupied by the tank, would afford essential accommodation for the deposit of certain Records greatly exposed to risk, but which are rarely wanted, and the Tower would be a most useful place to deposit them, while it would be unsuitable for Records in constant use.

It has also been suggested to the Office of Works, that it would be expedient to place the whole of the Record Premises (instead of, as at present, only a part) under the sole charge of the Metropolitan Police. A full survey of the buildings has been made for that purpose by Sir Richard Mayne, Chief Commissioner of Police, but the subject still remains under consideration.

X. TRANSFERS AND REMOVALS.

1. Transfers into the Public Record Office.

Chancery:—

Close Rolls, 1861; from Enrolment Office; 4 January 1864; 166 Rolls.

Decrees and Dockets; from Clerks of Records and Writs; 77 Decrees and 77 Dockets.

Recognizance Rolls, 1860; from Enrolment Office; 4 January 1864; 3 Rolls.

ADMIRALTY COURT:—

Registrar's Office:—

Prize Causes arising out of the War ended in 1814; 11 January 1864; 2,848 Causes.
Prize Causes arising out of the War of 1815; 11 January 1864; 108 Causes.
Prize Appeal Causes, 1803–1815, &c.; 11 January 1864; 1,303 Causes.

Pursuant to Registrar's Letter of 18 December 1863.

HOME OFFICE:—

Public Schools' Commission:—

Papers and Documents; 29 June 1864; 1 box and 2 parcels; pursuant to Home Office Letter of 7 June 1864.

COLONIAL OFFICE:—

Ionian Islands, Papers relating to, 1803–1864; 12 and 15 July and 15 August 1864; 43 boxes, containing 724 Volumes, and unbound Correspondence, Petitions, &c., equal to about 1,200 Volumes.

WAR OFFICE:—

Commissariat Books, 1793–1859; 11 April 1864; 322 Volumes; pursuant to War Office Letters of 21 November 1863 and 15 February 1864.

Discharge Documents, 1862; 10 March 1864; 78 bundles; pursuant to War Office Letter of 7 March 1864.

Regimental Pay Lists, 1855–6 and 1856–7; 18 April 1864; 276 Volumes; pursuant to War Office Letter of 22 March 1864.

Regimental Pay Lists, 1857–8; 28 November 1864; 168 Volumes: pursuant to War Office Letter of 19 November 1864.

2. TRANSFERS FROM THE PUBLIC RECORD OFFICE.

TO COMMISSIONERS OF CUSTOMS:—

English Customs' Establishment Books, 1679–1813; 27 January 1864; 488 Volumes.
Scotch Customs' Establishment Books, 1823–1825; 27 January 1864; 9 Volumes.
Salt Duty Customs' Establishment Books, Scotland, 1767–1798; 27 January 1864; 112 Volumes.
American Customs' Establishment Books, 1767–1776; 27 January 1864; 29 Volumes.

Pursuant to Treasury Letter of 20 November 1862, and Letter from Commissioners of Customs of 22 January 1864.

XI. ARRANGEMENT, REPAIRS, BINDING, AND SIMILAR OPERATIONS.

CHANCERY :—

Charter Rolls; 2 Rolls mended.

Charters; 6 flattened; 6 seals mended.

Close Rolls; 4 Rolls and 6 membranes mended; 390 Rolls ticketed.

Decree Rolls; 46 membranes damped and opened.

Decrees; 314 membranes sewed, and made into Rolls; 30 covers sewed.

Depositions, 1 Eliz.; 13 membranes repaired.

Inquisitions post mortem; 52 membranes flattened, guarded, and mended.

Miscellaneous; 27 membranes flattened, repaired, &c.

Pardon Rolls, 1 Eliz.; 2 Rolls and 6 membranes mended.

Patent Rolls; 59 membranes mended.

Recognizance Rolls, 1860; ticketed, &c.

Royal Letters; 600 stamped, and bound in volumes.

QUEEN'S BENCH :—

Crown Side :—

Coram Rege Roll, Hen. III.; 1 membrane mended.

Plea Side :—

Accruing Records, 1840–1842; 175 volumes and 51 bundles; arranged, packed, ticketed, and placed in Presses; Lists.

COMMON PLEAS :—

Feet of Fines; 3,328 numbered and stamped; 2 repaired; 46 bundles tied up in counties.

King's Silver Books, 50 Geo. III.; 15 volumes mended.

Notes of Fines, 1659—15 Charles II.; 1,243 suits sorted, flattened, connected, and packed.

EXCHEQUER OF PLEAS :—

Accruing Records, 1840–1842; 179 bundles, arranged, packed, ticketed, and placed in Presses; Lists.

Miscellaneous; 347 bundles dusted.

EXCHEQUER :—

Queen's Remembrancer :—

Affidavits, 1829–1842; flattened, placed in 41 bundles, and ticketed.

Affidavits, General, Trin. 1839; mended.

Escheators' Accounts, 7 & 8 Hen. IV.; 14 membranes guarded.

Ministers' and Receivers' Accounts, Hen. VIII.; sorted chronologically, numbered, checked, &c.; 3 mended; Lists.

Miscellaneous; 1,876 Rolls identified with slips, numbered, packed, and ticketed; 2 Documents mended; 3 Rolls new covers; 1,522 membranes flattened

Special Commissions; 3 repaired.

EXCHEQUER—*Queen's Remembrancer—continued.*

Subsidies; numbered, identified with slips, and checked with printed Calendar; slips sorted and arranged.

Tax Accounts, before 1689; incorporated with Subsidies.

Lord Treasurer's Remembrancer's and Pipe Offices:—

Household and Wardrobe Accounts; 260 Rolls re-arranged, rolled up, and ticketed.

Miscellaneous; 1,538 Rolls ticketed, 1 Roll mended.

First Fruits:—

Bishops' Certificates, St. David's; mended.

Treasury of the Receipt:—

Miscellaneous; classification and arrangement continued; 576 membranes flattened and mended.

Privy Seal Writs, 11–18 Charles II.; 51 membranes flattened.

COURT OF REQUESTS:—

Affidavit Books, 33 Eliz.–16 Charles I.; 22 volumes arranged, dated, ticketed, &c.

Appearance Books; arranged, dated, ticketed, &c.

Cause Lists; arranged, dated, ticketed, &c.

Commissions Returned; arranged, dated, ticketed, &c.

Note Books; arranged, dated, ticketed, &c.

Order Books, 17 Hen. VII.—18 Charles I.; 66 volumes arranged, dated, ticketed, &c.

Proceedings, Hen. VIII.—Charles I.; arrangement, sorting into reigns, &c., completed; about 196 bundles, or 75,600 Documents.

Process Books; arranged, dated, ticketed, &c.

Witness Books; 28 Eliz.–17 Charles I.; 10 volumes arranged, dated, ticketed, &c.

COURT OF WARDS AND LIVERIES:—

Inquisitions; 1 membrane flattened, repaired, &c.

Proceedings, Hen. VIII.—Charles I.; arrangement, sorting into reigns, &c., completed; about 97 bundles, or 200,000 Documents.

COURT OF ADMIRALTY:—

Registrar's Office:—

Prize Causes, 1803–1810; 1,062 arranged, flattened, packed in 43 bundles, and in Presses; Lists.

WELSH:—

Bills, Answers, Decrees, &c. (Chester); sorted into years and packed.

Bills of Costs (Carmarthen); 6,208 suits flattened.

Declarations (Carmarthen Circuit); sorted into years, and packed.

Declarations and Affidavits (Cardigan); 14,901 suits flattened.

Indictment Rolls (Chester and Flint), Edw. III.—Hen. VIII.; 14 Rolls, 447 membranes, mended.

WELSH—*continued.*

Indictment Rolls (Macclesfield); membranes examined and arranged.

Inquisitions, &c. (Chester and Flint); numbered and ticketed.

Plea Rolls; covers sewed on 14 Rolls; loose membranes dated and arranged chronologically.

Recognizance Rolls, 15 Charles II.; repaired.

Rule Books; 16 volumes bound.

Ruthin Court Rolls; incorporated, &c.; new cover to 1 Roll.

Seal Books; 36 volumes bound.

AUDIT OFFICE:—

Imprest Rolls, &c.; arranged.

Miscellaneous; arranged in 271 bundles: Lists.

HOME OFFICE:—

Domestic, Elizabeth—Charles I. (including 7 bundles, Foreign); 87 bundles, 20,569 leaves, repaired, guarded, stamped, and bound in 87 volumes; 299 volumes stamped.

FOREIGN OFFICE:—

Foreign, Elizabeth; 7 bundles repaired, &c. (*See* Home Office.)

COLONIAL OFFICE:—

Ionian Islands Papers, 1803–1864; arrangement in progress; unbound Correspondence and Petitions arranged chronologically and flattened; Books arranged chronologically in classes.

QUEEN'S PRISON:—

Papers; arrangement in progress.

TREASURY:—

Commissariat and other Books; 1,432 volumes ticketed.

Registered Papers: sorted, dated, incorporated, and arranged; 83 flattened, mended, &c.: Lists.

TREASURY SOLICITOR:—

Papers; examination and arrangement, continued.

WAR OFFICE:—

Regimental Pay Lists, 1855–1858; 444 volumes arranged and placed in Presses; Lists.

Binding:—6 volumes bound, repaired, &c.

Search Offices:—120,303 membranes stamped on production to Inquirers.

XII. INVENTORIES.

CONTENTS OF PUBLIC RECORD OFFICE:—continued, chronologically: Press List continued.

CALENDARS, INDEXES, &c., IN PUBLIC RECORD OFFICE:—
Additions to Inventory (*see* Appendix, No. 7).

QUEEN'S PRISON:—
Papers; in progress.

XIII. CALENDARS AND CATALOGUES.

CHANCERY:—
Close Rolls, 1757–1837; Plans annexed to Inclosure Awards (*see* Appendix No. 1b).
Decrees; 5 Rolls, 62 Decrees.
Patent Rolls, 50 Hen. III.; completed; 1375 entries.
„ 54–56 Hen. III., continued.
„ 1 Edw. I., in progress; 610 entries, 2,014 cross references; 161 entries sorted.
Royal Letters; continued.

QUEEN'S BENCH:—
Plea Side:—
Judgment Rolls, Geo. III. and IV.; Plans annexed to Deeds, and to Awards of Inclosure Commissioners (*see* Appendix No. 1a).

COMMON PLEAS:—
Recovery Rolls, Geo. III. and IV.; Plans annexed to Deeds, and to Awards of Inclosure Commissioners (*see* Appendix No. 1a).

EXCHEQUER:—
Queen's Remembrancer:—
Bills and Answers, Eliz.; continued; 955 suits.
Depositions by Commission, 27–30 Eliz.; 253 suits.
Ministers' Accounts, 1–24 Hen. VIII.

WELSH:—
Bills and Answers (Chester), Eliz.; 46 entries and 99 cross references.
Plea Rolls; Deeds, Inquisitions, and Writs of Dower (Chester), Hen. III. and Edw. I.; completed (*see* Appendix No. 4).
Recognizance Rolls, 2 & 3—13 Hen. V.; continued; 1,672 entries and 1,757 cross references, in alphabetical arrangement.
Warrants, Signed Bills, and Privy Seals (Chester and Flint), Hen. VI.—Eliz.; completed (*see* Appendix No. 2).
Writs of General Livery, Ouster le Main, &c., (Chester), Eliz.—Charles I.; completed (*see* Appendix No. 3).

LETTERS AND PAPERS, FOREIGN AND DOMESTIC:—
Hen. VIII., continued; printed to 1519.

AUDIT OFFICE:—
Miscellaneous Catalogues (*see* Appendix No. 7).

HOME OFFICE:—
Domestic; Charles I., continued; printed to October 1635.
Domestic; Charles II., continued; printed to February 1668.

FOREIGN OFFICE:—
Foreign; Elizabeth, continued; printed to February 1560.

COLONIAL OFFICE:—
Colonial; East Indies, China, and Japan; continued to 1623.

TREASURY:—
Registered Papers; continued.

TREASURY SOLICITOR:—
Papers, &c.; continued to 1747.

XIV. INDEXES.

CHANCERY:—
Close Rolls; 1848, continued; 99 Rolls, 1,635 Instruments.

COMMON PLEAS:—
Feet of Fines, Geo. II.; 5,805 Documents.

EXCHEQUER:—

Queen's Remembrancer:—
Depositions by Commission, 27–30 Eliz.

WELSH:—
Inquisitions, &c. (Chester and Flint); 2,012 entries (*see* Twenty-fifth Report, App. No. 3).

STATE PAPERS:—
Indexes to Printed Calendars.

ANNUAL REPORTS OF THE DEPUTY KEEPER OF THE PUBLIC RECORDS:—
Index to 22 Reports, nearly completed at Press.

All which is humbly submitted to Your Majesty.

Dated this 18th day of February 1865.

(Signed) T. DUFFUS HARDY,
Deputy Keeper of the Public Records.

I most humbly certify to Your Majesty that this Report is made by the Deputy Keeper of the Public Records, under my direction, pursuant to the Statute.

(Signed) JOHN ROMILLY, M.R.

APPENDIX

TO

THE TWENTY-SIXTH REPORT OF THE DEPUTY KEEPER OF THE PUBLIC RECORDS.

No. 1a.—King's Bench and Common Pleas.

List of Plans annexed to Deeds enrolled for Safe Custody, and to Awards of Commissioners for inclosing Common and other Lands enrolled pursuant to certain Statutes relating to the Inclosure of Lands.—George 3 and George 4.

County.	Parish or Place.	Reference to the Enrolment.	Particulars.
	King's Bench.		
	Judgment Rolls.		
Middlesex	St. Luke's	4 Geo. 3. 1764. East. Roll 172.	Land and messuages in or near Middle Row and Old Street.
Middlesex	St. Paul's, Covent Garden, and St. Martin's-in-the-Fields.	5 Geo. 3. 1765. East. 98.	Premises in Maiden Lane.
Middlesex	St. Bridget, otherwise St. Bride's, in the Ward of Farringdon.	8 Geo. 3. 1768. Trin. 201.	Certain land on the east side of "Three Leg Alley."
Chester	Cowhale or Caughale	13 Geo. 3. 1773. Hil. 885.	Division of Caughale Common, in the manor of Caughale, *alias* Cowhale.
Surrey	Tooting	14 Geo. 3. 1774. East. 94.	Premises on the east side of the highway leading from Tooting to Merton.
Leicester	Ibstock	15 Geo. 3. 1775. Trin. 161.	Inclosure and division of the common fields and waste grounds within the township and liberty of Ibstock.
London	St. Alban's, Wood Street, London.	16 Geo. 3. 1776. Hil. 177.	Messuages, &c., in Love Lane.
Westmoreland.	Brougham	18 Geo. 3. 1778. Hil. 282.	Inclosure and division of the common and waste grounds in Brougham.
Leicester	Kegworth	20 Geo. 3. 1780. Hil. 515.	Inclosure and division of the common fields and waste grounds in Kegworth.
Derby	Mickleover	21 Geo. 3. 1781. Trin. 600.	Inclosure and division of the common fields and waste grounds within the liberty of Findern.
Berks	Winckfield	29 Geo. 3. 1788. Mich. 498.	Certain messuages and lands in Winckfield.
Nottingham	Cropwell	29 Geo. 3. 1788. Mich. 1285.	Inclosure and division of the common fields and waste grounds within the lordships of Cropwell Butler and Cropwell Bishop.
Derby	Spondon	30 Geo. 3. 1790. Hil. 923.	Inclosure and division of the common fields, moors, and waste grounds within the hamlet or liberty of Spondon.
Somerset	Walcot	31 Geo. 3. 1791. Hil. 64.	Certain lands in Walcot.
Nottingham	Whatton	31 Geo. 3. 1791. Hil. 2108.	Inclosure and division of the common fields and waste lands within the lordship or liberty of Whatton.

No. 1a.—King's Bench and Common Pleas—*continued.*

County.	Parish or Place.	Reference to the Enrolment.	Particulars.
Leicester -	Lockington - - -	31 Geo. 3. 1791. East. 136.	Inclosure and division of the common fields and waste grounds within the lordship or manor of Hemmington.
Somerset -	Walcot - - - -	32 Geo. 3. 1792. East. 732.	Certain lands situate at East Hays.
Somerset -	Walcot - - - -	33 Geo. 3. 1793. Hil. 92.	A piece of ground on the west side of the city of Bath.
Derby - -	Spondon - - - -	33 Geo. 3. 1793. Hil. 144.	Inclosure and division of the common fields and waste grounds within the liberty of Chaddesden.
Derby - -	Melbourne - - -	33 Geo. 3. 1793. East. 498.	Inclosure and division of the common fields within the liberty of Melbourne.
Stafford -	St. Mary, in the city of Lichfield.	33 Geo. 3. 1793. Trin. 1035.	Certain land in Lichfield.
Stafford -	St. Mary, in the city of Lichfield.	33 Geo. 3. 1793. Trin. 1036.	Certain land in Lichfield.
Somerset -	St. Augustine's, city of Bristol.	33 Geo. 3. 1793. Trin. 2687.	Certain land called "Canters" alias "Cantells Clere," situate on St. Michael's Hill.
Derby - -	Spondon and Stanley -	34 Geo. 3. 1794. East. 547.	Inclosure and division of the common fields and waste grounds within the manor of Stanley.
Surrey - -	Mickleham - - -	37 Geo. 3. 1797. East. 199.	The manor or reputed manor of Fridley.
Nottingham	Bunney - - - -	38 Geo. 3. 1798. Trin. 742.	Inclosure and division of the common fields and waste grounds within the manor of Bunney.
Nottingham	Great Leake, otherwise East Leake.	39 Geo. 3. 1799. Trin. 858.	Inclosure and division of the common fields and waste grounds in Great Leake, otherwise East Leake.
Derby - -	Church Broughton - -	39 Geo. 3. 1799. Trin. 893.	Inclosure and division of the common fields, moors, and waste grounds within the liberty of Sapperton.
Bedford -	Crawley, otherwise Husborn Crawley.	40 Geo. 3. 1800. East. 38.	Inclosure and division of the common fields, &c., in Crawley, alias Husborn Crawley.
Nottingham	Keyworth - - -	40 Geo. 3. 1800. East. 1081.	Inclosure and division of the common fields and waste grounds within the township or liberty of Keyworth.
Surrey - -	Rotherhithe - - -	40 Geo. 3. 1800. Trin. 482.	Water-pipe, &c., in Love Lane, Rotherhithe.
Surrey - -	St. Mary, Newington -	40 Geo. 3. 1800. Trin. 915.	Certain land in Newington.
Lincoln -	Great Carlton - - -	41 Geo. 3. 1800. Mich. 806.	Drainage and preservation of certain low lands in Great Carlton.
Somerset -	Bishop's Hull - - -	42 Geo. 3. 1802. East. 1613.	Certain land in Bishop's Hull.
Somerset -	Bishop's Hull - - -	42 Geo. 3. 1802. East. 1614.	Certain land in Bishop's Hull.
Essex - -	Dedham - - - -	43 Geo. 3. 1803. Hil. 949.	Inclosure and division of heaths, commons, &c., in Dedham.
Derby - -	Ticknall - - - -	43 Geo. 3. 1803. Trin. 252.	Certain land in Ticknall.
Lancaster -	Oldham - - - -	44 Geo. 3. 1804. Trin. 393.	Inclosure and division of the common and waste lands in Oldham.
Hertford -	Tring - - - -	45 Geo. 3. 1804. Mich. 373.	Inclosure and division of the common fields and waste lands in Tring.
Derby - -	Chellaston - - -	45 Geo. 3. 1805. Hil. 859.	Inclosure and division of the common fields and waste lands in Chellaston.
Berkshire -	Sutton Courtney - -	45 Geo. 3. 1805. East. 399.	Inclosure and division of the common fields and waste lands in Sutton Courtney and Sutton Wick.
Berkshire -	Chipping Lambourne -	45 Geo. 3. 1805. East. 400.	Inclosure and division of the common fields, &c., within the township of Up-Lambourne.
Berkshire -	Herwell - - - -	45 Geo. 3. 1805. Trin. 169.	Inclosure and division of the common fields and waste grounds.

No. 1a.—King's Bench and Common Pleas—*continued.*

County.	Parish or Place.	Reference to the Eurolment.	Particulars.
Berkshire -	Blewberry - - -	46 Geo. 3. 1805. Mich. 65.	Inclosure and division of the common fields, downs, &c., in Blewberry.
Derby - -	Alvaston and Bolton -	46 Geo. 3. 1805. Mich. 229.	Inclosure and division of the common fields and waste grounds in Alvaston and Bolton.
Leicester -	Breedon-on-the-Hill -	46 Geo. 3. 1806. Hil. 142.	Inclosure and division of the common fields and waste grounds within the manor of Worthington and Breedon-on-the-Hill and township of Newbold.
Stafford -	Ellaston - - - -	46 Geo. 3. 1806. Hil. 172.	Inclosure and division of the commons and waste grounds within the lordship or liberty of Stanton.
Middlesex -	St. Dunstan, Stebunheath, otherwise Stepney.	46 Geo. 3. 1806. Hil. 242.	Certain lands in the hamlets of Poplar and Blackwall.
Hertford -	Cheshunt - - -	46 Geo. 3. 1806. Hil. 257.	Inclosure and division of the common fields in Cheshunt, and common called Cheshunt Common.
Bucks - -	Wooburn, otherwise Bishop's Wooburn, otherwise Wooburn Denecourt.	46 Geo. 3. 1806. Trin. 353.	Certain messuages, lands, and mills in Wooburn.
Middlesex -	St. Dunstan, Stebunheath, otherwise Stepney, and St. Leonard, Bromley, otherwise Bromley St. Leonard.	47 Geo. 3. 1806. Mich. 227.	Certain land near the East India Docks.
Middlesex -	St. Mary Matfellon, otherwise White Chapel.	47 Geo. 3. 1806. Mich. 228.	Certain parcels of ground near Goodman Style.
Middlesex -	St. George's in the East -	47 Geo. 3. 1807. Hil. 37.	Certain messuages and lands in St. George's in the East.
Derby - -	Kirk Ireton and Callors -	47 Geo. 3. 1807. Trin. 316.	Inclosure and division of lands within the township of Kirk Ireton.
Bedford, Huntingdon, and Cambridge.	Everton *cum* Tetworth -	47 Geo. 3. 1807. Trin. 991.	Inclosure and division of the common fields, &c., within the township of Everton.
Chester - -	Ashton-upon-Mersey -	48 Geo. 3. 1807. Mich. 33.	Inclosure of lands within the township of Sale.
Monmouth -	Llanthewy - - -	50 Geo. 3. 1810. Hil. 164.	Certain land in Llanthewy.
Stafford -	Cheddleton - - -	50 Geo. 3. 1810. Trin. 456.	Inclosure and division of lands within the liberty or township of Barford.
Bedford -	Houghton Conquest -	50 Geo. 3. 1810. Trin. 600.	Inclosure and division of lands in Houghton Conquest.
Kent - -	Ruckinge or Orlston -	51 Geo. 3. 1810. Mich. 51.	Certain land on the south side of the Royal Military Canal.
Kent - -	Ruckinge - - -	51 Geo. 3. 1810. Mich. 60.	Certain land by the side of the Royal Military Canal and road.
Berks - -	Kingston Bagpuize -	51 Geo. 3. 1810. Mich. 356.	Inclosure and division of lands in Kingston Bagpuize.
Kent - -	Stone - - - -	51 Geo. 3. 1810. Mich. 361.	Certain land on the south side of the Royal Military Canal in Stone, Isle of Oxney.
Kent - -	St. Leonard - - -	51 Geo. 3. 1810. Mich. 363.	Certain lands in the town and port of Hythe.
Kent - -	- - - - - - -	51 Geo. 3. 1811. East. 362.	Certain lands on the south side of the Royal Military Canal.
Kent - -	Kennardington and Narehorne.	51 Geo. 3. 1811. East. 363.	Certain land in Kennardington and Narehorne.
Derby - -	Matlock - - - -	52 Geo. 3. 1812. East. 329.	A cottage near Castle Toplands.
Berks - -	Ardington - - -	53 Geo. 3. 1813. Hil. 2517.	Inclosure and division of commons and common fields in Ardington.
Glouceste	Thornbury - - -	53 Geo. 3. 1813. East. 130.	Inclosure and division of lands in the hamlet of Rangeworthy.
Kent -	Warehorne and Ockstone.	53 Geo. 3. 1813. Trin. 142.	Certain land on the south side of the Royal Military Canal.

No. 1a.—King's Bench and Common Pleas—*continued.*

County.	Parish or Place.	Reference to the Enrolment.	Particulars.
Middlesex	St. Mary Abbott's, Kensington.	54 Geo. 3. 1814. Trin. 73.	A certain parcel of ground in Kensington, known by the name of Paramours Pingle.
Essex	Hornchurch, Romford, Havering, and Havering-atte-Bower.	54 Geo. 3. 1814. Trin. 751.	Inclosure and division of common and waste lands in Hornchurch, Romford, and Havering.
Berks	Chaddleworth	55 Geo. 3. 1815. East. 222.	Inclosure and division of lands in Chaddleworth.
Berks	Drayton	55 Geo. 3. 1815. Trin. 645.	Inclosure and division of lands in Drayton.
Wilts	Cherton	56 Geo. 3. 1816. Trin. 200.	Inclosure and division of lands within the township or hamlet of Conock.
Northumberland.	Ovingham	57 Geo. 3. 1816. Mich. 400.	Inclosure and division of lands within the barony of Prudhoe.
Somerset	Bridgwater	57 Geo. 3. 1817. Hil. 2060.	Certain messuages and lands in Dunwear and North Bower.
Lincoln	Thorsway	58 Geo. 3. 1817. Mich. 46.	Inclosure and division of the common fields, warren, and waste lands in Thorsway.
Derby	Breadsall	58 Geo. 3. 1817. Mich. 428.	Inclosure and division of lands in Breadsall.
Cornwall	Wendron Mawgan in Menage and Sithney.	59 Geo. 3. 1819. Hil. 480.	Inclosure and division of waste lands in the borough of Helleston.
Southampton	East Woodhay	1 Geo. 4. 1820. Trin. 381.	Inclosure of lands within the manor of Ecchingswell and the tything of East Woodhay.
Bucks	Chively	1 & 2 Geo. 4. 1821. Hil. 730.	Inclosure of lands in Chively.
Southampton	Warblington	1 & 2 Geo. 4. 1821. Hil. 850.	Division and allotment of Ennsworth common and other waste lands.
Sussex and Southampton.	Chidham, Westbourne, and Warblington.	2 Geo. 4. 1821. Trin. 906.	Inclosure of lands in Chidham, Westbourne, and Warblington.
Essex	Wennington	2 & 3 Geo. 4. 1822. Hil. 2446.	Lands near Southwell Bridge, in Wennington.
Surrey	Rotherhithe	3 Geo. 4. 1822. East. 401.	Messuages and land in Rotherhithe.
Surrey	St. Mary's, Rotherhithe	3 Geo. 4. 1822. East. 402.	A piece of ground at the south-east corner of Church Street, St. Mary's, Rotherhithe.
Oxfordshire	Taynton	3 Geo. 4. 1822. East. 415.	Inclosure of lands in Taynton.
Herts	Cheshunt	3 Geo. 4. 1822. Trin. 72.	Deed of mutual covenants of a lane called Theobald's Lane.
Sussex	Westbourne	3 & 4 Geo. 4. 1823. Hil. 944.	Inclosure of lands within the manors of Woodmancot, Nutbourne, and Prinsted.
Lancashire	Ulverston	4 Geo. 4. 1823. Trin. 31.	Inclosure of lands in Ulverston.
Warwick	Birmingham	4 Geo. 4. 1823. Mich. 631.	Certain lands in Birmingham.
Essex	Barking	5 Geo. 4. 1824. Trin. 1855.	A piece of land near Eastbury House, Ripplesides.
Kent	Tonbridge	6 Geo. 4. 1825. Mich. 866.	Certain lands in Tonbridge.
Wilts	Woodsford Castle	6 & 7 Geo. 4. 1826. Hil. 578.	The river Froome, with other rivers and streams adjacent.
Surrey	St. Mary's, Lambeth	7 Geo. 4. 1826. East. 254.	The manor or lordship of Lovehurd.
Surrey	Lambeth	7 Geo. 4. 1826. Trin. 200.	Land in Norwood.
Kent	Lenham	7 Geo. 4. 1826. Mich. 1094.	The manor of Chileston alias Chilston, and reputed manor of Bowley, with other lands, &c.
Berk	Bray and Maidenhead	7 & 8 Geo. 4. 1827. Hil. 1328.	Partition of lands, messuages, &c., in Bray and Maidenhead.
Bucks	Iver	8 Geo. 4. 1827. East. 304.	Messuages, lands, &c., in Iver.

No. 1a.—King's Bench and Common Pleas—*continued.*

County.	Parish or Place.	Reference to the Enrolment.	Particulars.
Westmoreland.	Ormside - - - -	8 Geo. 4. 1827. Mich. 738.	Inclosure of lands within the township of Little Ormside.
Berks - -	Marcham - - -	8 Geo. 4. 1827. Mich. 1462.	Inclosure of lands within the township of Garford.

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Kent - -	Gravesend - - -	3 Geo. 3. 1763. Trin. 24.	Certain premises in Gravesend.
Somerset -	Walcot - - - -	7 Geo. 3. 1766. Mich. 164.	Parcel of land called by the name of "the Hays furlong" and "the Hays lower furlong."
Somerset -	Walcot - - - -	7 Geo. 3. 1766. Mich. 172.	Parcel of land called by the name of "the Hays."
Nottingham -	Kitton and Worksop -	7 Geo. 3. 1766. Mich. 184.	Certain lands and messuages in Kitton and Worksop.
Kent - -	St. Paul's, Deptford -	7 Geo. 3. 1767. East. 61.	A mill, with its appurtenances.
London - -	Christchurch, London -	8 Geo. 3. 1767. Mich. 30.	Certain messuages and lands.
Middlesex -	St. Giles'-in-the-Fields -	8 Geo. 3. 1767. Mich. 31.	A piece of ground on the south side of Parker's Lane.
Somerset -	St. James' (Bath), Walcot, Weston Langridge, and Woolley.	8 Geo. 3. 1768. Hil. 30.	A piece of ground within the manor of Walcot, and divers messuages, lands, &c.
Somerset -	Walcot - - - -	8 Geo. 3. 1768. Hil. 49.	Certain land behind the King's Circus at Bath.
Somerset -	Walcot - - - -	8 Geo. 3. 1768. Hil. 55.	Certain messuages and lands in Walcot.
Lincoln -	Boston West, Skirbeck Quarter, Wyberton, Frampton, Kirton, Algarkirke, Fosdyke, Sutterton, Wigtoft, Swinhead, and Brothertoft.	9 Geo. 3. 1769. Trin. 141.	Inclosure of the Haute, Huntre, or Holland fen.
Middlesex -	St.-George's-in-the-East	9 Geo. 3. 1769. Trin. 231.	Messuages, &c., in Gravel Lane.
Lincoln -	Ancaster - - - -	10 Geo. 3. 1770. Hil. 112.	Inclosure of lands within the liberty of Sudbrook and manor of Ancaster.
Lincoln -	Beckingham - - -	10 Geo. 3. 1770. Trin. 171.	Inclosure of lands within the townships of Beckingham and Sutton, within the manor of Beckingham.
Lincoln -	Westborough and Doddington.	12 Geo. 3. 1772. Hil. 282.	Inclosure of the open fields and waste grounds within the townships of Westborough and Doddington.
Middlesex -	St. Margaret's, Westminster.	13 Geo. 3. 1773. Hil. 49.	A piece of ground upon which part of the New Court of Common Pleas stands, on the west side of Westminster Hall.
Middlesex -	Shoreditch - - -	13 Geo. 3. 1773. Easter 2.	A piece of ground in Shoreditch.
Stafford -	Burton - - - -	14 Geo. 3. 1773. Mich. 126.	Inclosure and division of common and waste ground called the Outwood, within the township or hamlet of Horninglow.
Stafford -	Leek - - - - -	14 Geo. 3. 1773. Mich. 153.	Inclosure and division of commons and waste grounds within the manor of Rushton James.
Nottingham	North Muskham - -	14 Geo. 3. 1774. Hil. 93.	Inclosure and division of the open fields and waste grounds within the townships of North Muskham, Holme, and Bathley.
Nottingham	Cromwell - - -	14 Geo. 3. 1774. Easter 6.	Inclosure and division of the open fields and waste grounds in Cromwell.
Lincoln -	Ancaster - - - -	14 Geo. 3. 1774. Trin. 151.	Inclosure and division of the open fields, common heath, and waste grounds within the township of West Willoughby, in the manor of Sudbrook.

No. 1a.—King's Bench and Common Pleas—*continued.*

County.	Parish or Place.	Reference to the Enrolment.	Particulars.
Lincoln -	Helpingham - - -	14 Geo. 3. 1774. Trin. 223.	Inclosure and division of the open fields, common, fen and other lands in Helpingham.
Lincoln -	Wilsford, otherwise Willisford.	15 Geo. 3. 1775. Hil. 166.	Inclosure and division of the open fields, common, heath and waste grounds within the manor of Wilsford, alias Willisford.
Nottingham	Laneham - - -	15 Geo. 3. 1775. Hil. 191.	Inclosure and division of the open fields, common and waste grounds in Laneham.
Stafford -	In the township of Hatherton, Otherton, Robaston, Water Eaton, and Kinvaston.	15 Geo. 3. 1775. Hil. 272.	Inclosure and division of the common or waste lands called Galley Common, within the manor or lordship of Galley.
Durham -	Westwick - - - -	15 Geo. 3. 1775. Trin. 137.	Certain land adjoining the river Tees, for piers, jetties, &c.
Nottingham	Southwell - - - -	16 Geo. 3. 1776. Hil. 78.	Inclosure and division of the common or waste grounds called Cottmore and Radley, within the district of Southwell and Westhorpe.
Stafford -	Trysull - - - -	16 Geo. 3. 1776. Hil. 149.	Inclosure and division of the common and waste lands within the manors of Trysull and Seisdon.
Nottingham	Southwell - - -	16 Geo. 3. 1776. Hil. 173.	Inclosure and division of the open fields and commons within the district of Normanton.
Middlesex -	St. Giles' Without, Cripplegate.	16 Geo. 3. 1776. Hil. 254.	Tenements and lands in Cherry Tree Alley alias French Alley, near Old Street.
Stafford -	Mayfield - - - -	16 Geo. 3. 1776. Trin. 147.	Inclosure and division of the open fields and waste ground within the manor of Butterton.
Lincoln -	Quadring and Hundred of Quadring.	17 Geo. 3. 1777. Hil. 194.	Inclosure and division of the commons, fens, and common fields and waste grounds in Quadring.
Lincoln -	Gunby and North Whitham.	17 Geo. 3. 1777. Easter 17.	Inclosure and division of the open fields, common and waste lands within the liberties of Gunby and North Whitham.
Lincoln -	Welby - - - - -	17 Geo. 3. 1777. Easter 36.	Inclosure and division of the open fields, commons, heath, and waste ground within the manor of Welby.
Middlesex -	St. George's, Hanover Square.	17 Geo. 3. 1777. Trin. 47.	A piece of land near a certain field known by the name of Brookshott.
Nottingham	Clareborough - - -	9 Geo. 3. 1779. Hil. 115.	Inclosure and division of the open fields, commons, fen and waste lands within the township of Clareborough and Welham.
Lincoln -	Surfleet - - - - -	19 Geo. 3. 1779. Hil. 164.	Inclosure and division of common fields, fen, marsh, and other waste lands in Surfleet.
Nottingham	Edwinstowe - - -	19 Geo. 3. 1779. Trin. 184.	Inclosure and division of the common and waste grounds within the township of Ollerton.
Lincoln -	Tetney - - - - -	19 Geo. 3. 1779. Trin. 244.	Inclosure and division of the common fields and waste lands within the lordship of Tetney.
Stafford -	Trysull - - - - -	20 Geo. 3. 1780. East. 24.	Inclosure and division of the common and waste lands within the manors of Trysull and Seisdon.
Warwick -	Weston-under-Wetheley	20 Geo. 3. 1780. East. 68.	Inclosure and division of the common fields, &c., in Weston-under-Wetheley.
Nottingham -	Bleasby - - - -	20 Geo. 3, 1780. Trin. 256.	Inclosure and division of the common fields and waste grounds in Bleasby.
Nottingham	Barnsfield - - -	20 Geo. 3. 1780. Trin. 274.	Inclosure and division of the open fields, common, forest, and waste ground in Barnsfield.
Middlesex -	Stepney - - -	20 Geo. 3. 1780. Trin. 439.	A piece of marsh land in Poplar Marsh, commonly known by the name of "The Eighteen Acres."

No. 1a.—King's Bench and Common Pleas—*continued.*

County.	Parish or Place.	Reference to the Enrolment.	Particulars.
Leicester	Thornton	20 Geo. 3. 1780. Trin. 448.	Inclosure and division of the open fields, common and waste grounds, within the township of Stanton-under-Bardon.
Leicester	Stonesby	21 Geo. 3. 1781. East. 46.	Inclosure and division of the open fields and other commonable lands within the lordship of Stonesby.
Nottingham	Halam and Edingley	21 Geo. 3. 1781. East. 84.	Inclosure and division of the open fields, common and waste grounds, in Halam and Edingley.
Middlesex	St. Martin's-in-the-Fields	21 Geo. 3. 1781. Trin. 31.	Messuages, &c., on the south side of the Strand.
Kent	St. Paul's, Deptford	21 Geo. 3. 1781. Trin. 88.	A piece of land and wharf at Deptford.
Nottingham	Orston	21 Geo. 3. 1781. Trin. 118.	Inclosure and division of the open fields, common and waste grounds, within the township of Scarington and Aslacton.
Lincoln	Nettleham	21 Geo. 3. 1781. Trin. 180.	Inclosure and division of the open fields and other commonable and waste grounds within the manor of Nettleham.
Derby	Marston-upon-Dove	21 Geo. 3. 1781. Trin. 214.	Inclosure and division of the open fields, common and waste lands, within the hamlet of Hilton.
Surrey	St. Mary, Rotherhithe	22 Geo. 3. 1781. Mich. 128.	Messuages, &c., on the south side of High Street, Rotherhithe.
Derby	Dale and Stanton	22 Geo. 3. 1782. Trin. 253.	Inclosure and division of Dale Moor and Stanton Moor, within the manors of Dale and Stanton.
Middlesex	Stepney, otherwise Stebonheath.	25 Geo. 3. 1784. Mich. 68.	A piece of land in Poplar Marsh.
Surrey	Battrichsea, otherwise Bathersea.	25 Geo. 3. 1785. Hil. 183.	Certain lands and tenements in Battersea.
Surrey	Cheam	25 Geo. 3. 1785. Trin. 166.	A capital messuage or mansion-house in East Cheam.
Leicester	Osgathorpe	26 Geo. 3. 1786. Trin. 261.	Inclosure and division of the open fields, common and waste lands, within the lordship of Osgathorpe.
Surrey	Cheam	26 Geo. 3. 1786. Trin. 319.	Certain messuages, farms, &c., in Cheam.
Derby	Morley	27 Geo. 3. 1786. Mich. 48.	Inclosure and division of the commons and waste grounds within the lordships of Morley and Smalley.
Derby	Duffield	27 Geo. 3. 1786. Mich. 134.	Inclosure and division of the open fields and other commonable and waste lands within the liberty of Holbrook.
London	St. Stephen's, Coleman Street.	27 Geo. 3. 1787. East. 112.	A piece of ground situate on the west side of Coleman Street, within the city of London.
Middlesex	St. John's, Hackney	27 Geo. 3. 1787. Trin. 317.	Messuages and land in Upper Clapton, near Stamford Hill.
Middlesex	St. John's, Hackney	28 Geo. 3. 1787. Mich. 132.	Messuages, &c., on the north side of Hill Street, Upper Clapton.
Middlesex	St. John's, Hackney	28 Geo. 3. 1788. Hil. 123.	Certain land in Upper Clapton.
Derby	Sawley	28 Geo. 3. 1788. Trin. 251.	Inclosure and division of the open fields, commons, and waste grounds within the hamlet of Sawley.
Derby	Burrow-upon-Trent	28 Geo. 3. 1788. Trin. 395.	Inclosure and division of the open fields, common and waste grounds, within the manor and hamlet of Burrow-upon-Trent.
Middlesex	St. John's, Hackney	28 Geo. 3. 1788. Trin. 448.	Messuages, with the appurtenances, at Upper Clapton, otherwise Stamford Hill.
Hereford	Hereford City	29 Geo. 3. 1789. Trin. 196.	A piece of land on the west side of Broad Street, Hereford.

No. 1a.—King's Bench and Common Pleas—*continued.*

County.	Parish or Place.	Reference to the Enrolment.	Particulars.
Derby	Little Chester	29 Geo. 3. 1789. Trin. 285.	Inclosure and division of the open fields, common and waste grounds, within the liberty of Little Eaton, within the manor of Little Chester.
Surrey	St. Mary's, Bermondsey	29 Geo. 3. 1789. Trin. 344.	Messuages and lands on the south side of a street called Snows Street.
Kent	St. Paul's and St. Nicholas	30 Geo. 3. 1789. Mich. 212.	Dockyard, messuages, lands, &c., in Deptford.
Buckingham	High Wycombe	30 Geo. 3. 1790. Hil. 63.	A piece of land at Londwater.
London	St. Anne's, Blackfriars	31 Geo. 3. 1791. Hil. 237.	A piece of ground in an alley called "Paved Alley," in the city of London.
Stafford	Colwich and Stow	31 Geo. 3. 1791. Trin. 301.	Inclosure and division of the open fields, commons, and waste grounds within the liberties of Hixton, Drointon, Lea, and Amerton, within the manor of Chartley.
Somerset	Walcot	32 Geo. 3. 1792. East. 16.	A piece of ground formerly called "New Leazes," near a place called the World's End.
Surrey	Croydon, otherwise Bermondsey.	33 Geo. 3. 1793. East. 13.	Tythable lands belonging to the Rectory of Croydon, otherwise Bermondsey.
Surrey	Croydon	34 Geo. 3. 1794. Hil. 109.	Tythable lands belonging to the Rectory of Croydon, otherwise Bermondsey.
Surrey	Croydon	34 Geo. 3. 1794. Hil. 112.	Tythable lands belonging to the Rectory of Croydon, otherwise Bermondsey.
Surrey	Croydon	34 Geo. 3. 1794. East. 82.	Tythable lands belonging to the Rectory of Croydon, otherwise Bermondsey.
Surrey	Croydon	35 Geo. 3. 1794. Mich. 55.	Tythable lands belonging to the Rectory of Croydon, otherwise Bermondsey.
Surrey	Croydon	35 Geo. 3. 1794. Mich. 59.	Tythable lands belonging to the Rectory of Croydon, otherwise Bermondsey.
Surrey	Croydon	35 Geo. 3. 1794. Mich. 63.	Tythable lands belonging to the Rectory of Croydon, otherwise Bermondsey.
Surrey	Croydon	35 Geo. 3. 1794. Mich. 117.	Tythable lands belonging to the Rectory of Croydon, otherwise Bermondsey.
Cambridge	Wisbech	35 Geo. 3. 1795. Hil. 59.	The ancient manor or tenement called the Castle of Wisbech, St. Peter's, Isle of Ely.
Lincoln	Tealby, otherwise Tevelby	35 Geo. 3. 1795. Hil. 69.	Inclosure and division of the common fields and other commonable and waste lands in Tealby.
Lincoln	Ludford Magna and Ludford Parva.	35 Geo. 3. 1795. Hil. 106.	Inclosure and division of the open fields and commonable and waste lands within the lordship of Ludford.
Surrey	Croydon	36 Geo. 3. 1796. Hil. 17.	Tythable lands belonging to the Rectory of Croydon, otherwise Bermondsey.
Surrey	Croydon	36 Geo. 3. 1796. Hil. 25.	Tythable lands belonging to the Rectory of Croydon, otherwise Bermondsey.
Somerset	King's Sedgmoore	36 Geo. 3. 1796. Hil. 29.	Inclosure, drainage, and division of a moor or tract of land called King's Sedgmoore.
Surrey	Little Bookham	36 Geo. 3. 1796. Hil. 326.	The manor or reputed manor of Little Bookham, with messuages and lands in Great and Little Bookham and Effingham.
Middlesex	St. Martin's-in-the-Fields and St. James'.		Also certain land in St. Martin's-in-the-Fields and St. James'.
Stafford	Wolverhampton	36 Geo. 3. 1796. East. 42.	Certain lands near Horsleyfield, in Wolverhampton.

No. 1a.—King's Bench and Common Pleas—*continued.*

County.	Parish or Place.	Reference to the Enrolment.	Particulars.
Buckingham-	Wendover - - -	36 Geo. 3. 1796. East. 62.	Inclosure and division of the open fields, common and waste lands, within the manor of Wendover.
Lincoln - -	Althorpe - - - -	36 Geo. 3. 1796. Trin. 73.	Inclosure and division of the open fields and commons within the township of Althorpe.
Lincoln - -	Barton-upon-Humber -	37 Geo. 3. 1797. Hil. 79.	Inclosure and division of the open fields, marshes, commons, and waste lands within the lordship of Barton-upon-Humber.
Lincoln -	Covenham, St. Bartholomew's, and Covenham, St. Mary.	37 Geo. 3. 1797. Hil. 138.	Inclosure and division of the open fields, commons, fens, and waste lands in Covenham.
Lincoln -	Caistor - - - -	38 Geo. 3. 1798. Hil. 40.	Inclosure and division of the open fields and other commonable and waste lands belonging to the manor of Caistor.
Lincoln -	St. Mary, South Kelsey, and St. Nicholas, South Kelsey.	38 Geo. 3. 1798. Hil. 68.	Inclosure and division of the open fields, common, furze, and waste lands in South Kelsey.
Lincoln -	Searby - - - -	38 Geo. 3. 1798. Hil. 105.	Inclosure and division of the open fields and other commonable lands belonging to the lordship of Swinby.
Lincoln -	Wintringham - - -	38 Geo. 3. 1798. East. 50.	Inclosure and division of certain lands in Wintringham.
Buckingham	Sherington - - -	38 Geo. 3. 1798. Trin. 103.	Inclosure and division of the open fields, commons, &c., in Sherington.
Leicester -	Market Bosworth - -	38 Geo. 3. 1798. Trin. 125.	Inclosure and division of the open fields, commons, &c., of Sutton Cheny, *alias* Sutton Chenell.
Lincoln -	Wood Enderby - -	39 Geo. 3. 1799. Hil. 77.	Inclosure and division of the open fields and commonable lands in Wood Enderby.
Lincoln -	Wood Enderby - -	39 Geo. 3. 1799. Hil. 93.	Inclosure and division of the open fields and commonable lands in Marcham le Fen.
Buckingham	Adstock - - - -	39 Geo. 3. 1799. Trin. 118.	Inclosure and division of the open fields, &c., within the manor of Adstock.
Stafford -	Abbots Bromley - -	39 Geo. 3. 1799. Trin. 174.	Inclosure and division of the common fields, commons, and waste grounds within the manors of Abbotts Bromley, otherwise Pagets Bromley, and Bagot Bromley.
Nottingham -	Worksop - - - -	40 Geo. 3. 1800. Hil. 10.	A piece of land in the town of Worksop.
Sussex -	Petworth - - - -	40 Geo. 3. 1800. Trin. 130.	Certain lands in Petworth.
Sussex -	Tillington - - -	40 Geo. 3. 1800. Trin. 132.	Tythable lands belonging to the Rectory of Tillington.
Leicester -	St. Margaret's, Leicester	41 Geo. 3. 1800. Mich. 5.	Messuages and lands in St. Margaret's, Leicester.
Surrey -	Richmond - - -	41 Geo. 3. 1801. Hil. 50.	A piece of land in Richmond, near "Heath shot."
Essex -	Terling - - - -	41 Geo. 3. 1801. East. 123.	Parcels of land in Terling.
Lincoln -	Mavis Enderby - -	41 Geo. 3. 1801. Trin. 141.	Inclosure and division of the open fields and commonable lands in Mavis Enderby.
Lincoln -	Bolingbrooke - - -	41 Geo. 3. 1801. Trin. 165.	Inclosure and division of the commonable lands in Bolingbrooke.
Nottingham -	Mansfield - - -	41 Geo. 3. 1801. Trin. 198.	Certain messuages and lands in Mansfield.
Northampton	Whittlebury - - -	41 Geo. 3. 1801. Trin. 201.	Inclosure and division of the open fields and commonable lands within the liberty of Whittlebury.
Southampton	Crawley - - - -	42 Geo. 3. 1801. Mich. 56.	Capital messuage called Rockley House in Crawley.
Norfolk -	Brooke - - - -	42 Geo. 3. 1802. Trin. 6.	Inclosure and division of the commons, fen, and waste lands in Brooke.

No. 1a.—King's Bench and Common Pleas—*continued.*

County.	Parish or Place.	Reference to the Enrolment.	Particulars.
Essex	Debden	42 Geo. 3. 1802. Trin. 22.	Certain wood ground known as Peveall's wood.
Lincoln	Barrow	43 Geo. 3. 1803. Hil. 92.	Inclosure and division of the open fields, commonable and waste lands, in Barrow.
Surrey	Ewell	43 Geo. 3. 1803. East. 62.	Inclosure and division of the common fields, commons, and waste grounds in Ewell.
Somerset	Bathwick	43 Geo. 3. 1803. Trin. 54.	Certain lands in Bathwick.
Middlesex and Surrey.	Laleham	43 Geo. 3. 1803. Trin. 160.	Inclosure and division of the open fields and commonable lands within the manor of Laleham.
Lincoln	Gainsborough	44 Geo. 3. 1804. Hil. 100.	Inclosure and division of the open fields and waste grounds within the township of Gainsborough.
Norfolk	- - - - -	44 Geo. 3. 1804. Hil. 174.	Inclosure, drainage, and improvement of certain waste lands called Marshland Smeeth and Marshland Fen.
Lincoln	East Halton	44 Geo. 3. 1804. East. 20.	Inclosure and division of the open fields, commons, and waste lands in East Halton.
Middlesex	Bromley, St. Leonard's	44 Geo. 3. 1804. East. 62.	Tythable lands in Bromley.
Lincoln	West Rasen	44 Geo. 3. 1804. East. 92.	Inclosure and division of the common fields and other lands in West Rasen.
Buckingham	Wyrardisbury, otherwise Wriasbury.	44 Geo. 3. 1804. Trin. 2.	Inclosure and division of the open fields, common and waste grounds, within the manor of Wyrardisbury.
Lincoln	South Ferriby	44 Geo. 3. 1804. Trin. 144.	Inclosure and division of the open fields and waste lands in South Ferriby.
Suffolk	Carton, Colville, Oulton, and Kirtley, otherwise Kirkley.	44 Geo. 3. 1804. Trin. 202.	Inclosure and division of the commons, heath, fen, and waste grounds in Carton, Colville, Oulton, &c.
Suffolk	Sotherton	45 Geo. 3. 1804. Mich. 46.	Inclosure and division of a common called Sotherton Moor.
Surrey	Rotherhithe, otherwise Redriffe.	45 Geo. 3. 1804. Mich. 53.	A piece of land, with the dock slips, launches for building ships, wharves, cranes, saw pits, messuages, &c.
Lincoln	Messingham	45 Geo. 3. 1804. Mich. 65.	Inclosure of the open fields, commons, and wastes within the township of Messingham.
Oxford	Headington	45 Geo. 3. 1805. Hil. 4.	Inclosure and division of the open fields, commons, and waste grounds in Headington.
Gloucester	St. George's, Bristol	45 Geo. 3. 1805. Hil. 65.	Certain messuages and land called by the name of the Royal Crescent, Upper Easton.
Surrey	St. Mary's, Rotherhithe	45 Geo. 3. 1805. Hil. 74.	A piece of land on the east of Trinity Street, on the road leading from Deptford to Rotherhithe.
Suffolk	Somerlayton, Blundeston, and Lound.	45 Geo. 3. 1805. Trin. 193.	Inclosure and division of commons, marshes, fens, and waste lands within the parishes of Somerlayton, Blundeston, and Lound.
Suffolk	Somerlayton, Blundeston, and Lound.	45 Geo. 3. 1805. Trin. 215.	Inclosure and division of commons, heath, marshes, fens, and waste lands in Somerlayton, Blundeston, and Lound.
Suffolk	Somerlayton, Blundeston, and Lound.	45 Geo. 3. 1805. Trin. 249.	Inclosure and division of commons, heaths, marshes, fens, and waste lands in the parishes of Somerlayton, Blundeston, and Lound.
Lincoln	Hundleby	45 Geo. 3. 1805. Trin. 286.	Inclosure and division of the open fields and "ings" in the parish of Hundleby.
Suffolk	Bucklesham and Foxhall	46 Geo. 3. 1805. Mich. 28.	Inclosure and division of heaths, commons, and waste grounds in the parishes of Bucklesham and Foxhall.
Lincoln	Belchford	46 Geo. 3. 1805. Mich. 93.	Inclosure and division of the open fields, commonable and waste lands, within the lordship of Belchford.

No. 1a.—King's Bench and Common Pleas—*continued.*

County.	Parish or Place.	Reference to the Enrolment.	Particulars.
Lincoln	Sotby	46 Geo. 3. 1805. Mich. 150.	Inclosure and division of the open fields, commonable and waste lands in Sotby.
Surrey	St. Mary Magdalen, Bermondsey.	46 Geo. 3. 1806. Hil. 8.	Certain pieces of land on the south side of Russell Street.
Lincoln	Louth	46 Geo. 3. 1806. East. 2.	Inclosure and division of the open fields and waste lands in Louth.
Lincoln	Burton and Westhalton	46 Geo. 3. 1806. East. 87.	Inclosure and division of the open fields, commons, and waste lands in the township of Burton, otherwise Burton-upon-Stather, in the hamlets of Stather, Darby, Thealby, and Coleby, in lieu of tythes, &c.
Kent	Snodland, Birling, East Malling, and Padlesworth.	46 Geo. 3. 1806. Trin. 38.	The manor of Veles, otherwise Velves.
Suffolk	Shaddingfield	46 Geo. 3. 1806. Trin. 47.	Inclosure and division of Shaddingfield Common.
Lincoln	Binbrooke, St. Gabriel, and Binbrooke. St. Mary.	46 Geo. 3. 1806. Trin. 85.	Inclosure of lands in Binbrooke.
Lincoln	Kirkby cum Osgodby	46 Geo. 3. 1806. Trin. 95.	Inclosure and division of the open fields, moors, and commonable lands in Kirkby cum Osgodby.
Buckingham	Wooburn	47 Geo. 3. 1806. Mich. 5.	Inclosure and division of the open fields, commons, and waste grounds in Wooburn.
Kent	Maidstone	47 Geo. 3. 1806. Mich. 92.	A certain piece of land or hop ground called Rush Meadow.
Berks	Chipping Lamburne, King's Heath.	47 Geo. 3. 1807. Hil. 35.	Inclosure and division of the open lands in Chipping Lamburne and King's Heath.
Northampton	Braddon	47 Geo. 3. 1807. Trin. 107.	Inclosure and division of the open fields and commonable lands within the liberty of Braddon.
Northampton	Green's Norton	47 Geo. 3. 1807. Trin. 119.	Inclosure and division of the open fields and commonable lands within Green's Norton and hamlet of Duncote.
Nottingham	Blythe and Carlton	48 Geo. 3. 1808. Hil. 82.	Messuages and lands in Hodsock and Carlton.
Derby	Bradbourne	48 Geo. 3. 1808. Hil. 150.	Inclosure and division of the open fields, &c., within the township of Brassington, otherwise Brasson.
Bedford	Salford	48 Geo. 3. 1808. East. 15.	Inclosure and division of lands within the manor of Salford.
Huntingdon	Staughton	48 Geo. 3. 1808. East. 130.	Inclosure and division of lands in the township of Great Staughton.
Buckingham	Aylesbury	48 Geo. 3. 1808. Trin. 57.	Messuage, &c., in Broad Street, Aylesbury.
Suffolk	Sudborne	48 Geo. 3. 1808. Trin. 133.	Inclosure and division of the common and waste grounds in Sudborne.
Kent	Northfleet	48 Geo. 3. 1808. Trin. 168.	Capital messuage known as "Hinehouse," with lands adjoining, in Northfleet.
Oxford	Islip	48 Geo. 3. 1808. Trin. 188.	Certain lands in Islip.
Middlesex	St. Margaret's, Westminster.	49 Geo. 3. 1808. Mich. 11.	Messuages and land in St. Margaret's, Westminster.
Middlesex	St. Martin's-in-the-Fields	49 Geo. 3. 1808. Mich. 23.	Certain messuages on the north side of Buckingham Court, near Charing Cross, within the liberty of Westminster.
Norfolk	Hickley	49 Geo. 3. 1808. Mich. 35.	Inclosure and division of the open fields, marsh, fen, and waste lands in Hickley.
Lincoln	Stowe	49 Geo. 3. 1809. Hil. 3.	Inclosure and division of the open fields, "ings," commons, moors, and waste lands within the township of Stowe, and hamlet of Sturton and Barnsby.
Norfolk	Haddiscoe	49 Geo. 3. 1809. Hil. 48.	Inclosure of lands within the manor of Haddiscoe.

No. 1a.—King's Bench and Common Pleas—*continued.*

County.	Parish or Place.	Reference to the Enrolment.	Particulars.
Norfolk	Gillingham, St. Mary; Gillingham, All Saints; Winston, and Windell.	49 Geo. 3. 1809. Hil. 73.	Inclosure of lands in Gillingham, Winston, and Windell.
Berks	West Hanney	49 Geo. 3. 1809. Hil. 90.	Inclosure and division of the open fields, commons, and waste lands in the hamlet of East Hanney.
Somerset	Walcot	49 Geo. 3. 1809. East. 8.	The newly-erected chapel called "All Saint's Chapel," in Walcot.
Hertford	Bushey	49 Geo. 3. 1809. East. 84.	Inclosure of lands in Bushey.
Bedford	Oakley	49 Geo. 3. 1809. East. 137.	Inclosure and division of the open fields, commons, and waste lands in Oakley.
Bedford	Eversholt	49 Geo. 3. 1809. East. 137.	Inclosure of lands in Eversholt.
Lincoln	Swallow	49 Geo. 3. 1809. Trin. 35.	Inclosure of lands in Swallow.
Suffolk	Westfield	50 Geo. 3. 1809. Mich. 50.	Inclosure of Westfield Green.
Berks	Milton	50 Geo. 3. 1810. Trin. 49.	Inclosure of lands in Milton.
Norfolk	Aldeby	50 Geo. 3. 1810. Trin. 121.	Inclosure of lands in Aldeby.
Wilts	Aldbourne, otherwise Aldborne, otherwise Alborne.	50 Geo. 3. 1810. Trin. 151.	Inclosure and division of lands in the township of Aldbourne.
Sussex	Cuckfield	51 Geo. 3. 1810. Mich. 10.	A certain parcel of land called "Highbridge Lay" and "the Pound Bay," in Cuckfield.
Sussex	Broadwater	51 Geo. 3. 1811. Hil. 9.	Inclosure of certain lands in Broadwater.
Surrey	St. John's, Southwark	51 Geo. 3. 1811. Hil. 89.	A piece of ground known by the name of the "Isle of Ducks."
Buckingham	Shottsbrooke and White Waltham.	51 Geo. 3. 1811. Hil. 113.	Inclosure of lands in Shottsbrooke and White Waltham.
Norfolk	Holt and Letheringsett	51 Geo. 3. 1811. Hil. 140.	Inclosure of lands in Holt and Letheringsett.
Cambridge	Harlton	51 Geo. 3. 1811. Hil. 174.	Inclosure of lands in Harlton.
Bedford	Fletwick	51 Geo. 3. 1811. East. 144.	Inclosure of lands in Fletwick.
Derby	Melbourne	51 Geo. 3. 1811. Trin. 26.	The manor or lordship of Melbourne.
Norfolk	Bobham	51 Geo. 3. 1811. Trin. 86.	Inclosure of certain lands in Bobham.
Middlesex	St. Pancrasse, alias Pancridge.	52 Geo. 3. 1811. Mich. 61.	Certain lands within the manor of Tottenhall.
Middlesex	St. Luke's, Chelsea	52 Geo. 3. 1812. Hil. 10.	A piece of land, being part of Chelsea common field.
Surrey	Thorpe	52 Geo. 3. 1812. Hil. 95.	Inclosure of lands in Thorpe.
Lincoln	Croxton	52 Geo. 3. 1812. Trin. 65.	Inclosure and division of lands in Croxton.
Sussex	Angmering	52 Geo. 3. 1812. Trin. 69.	Inclosure and division of the open fields and commons in Angmering.
Surrey	Addington	53 Geo. 3. 1812. Mich. 47.	Farmhouse, with barns, &c., in Addington.
Norfolk	Winterton, East Somerton, and West Somerton.	53 Geo. 3. 1813. Hil. 85.	Inclosure and drainage of lands in Winterton, and East and West Somerton.
Norfolk	Marcham	53 Geo. 3. 1813. Hil. 89.	Inclosure and drainage of lands in Marcham.
Norfolk	Wheatacre, All Saints	53 Geo. 3. 1813. Hil. 134.	Inclosure of lands in Wheatacre, All Saints.
Sussex	Warningscamp	53 Geo. 3. 1813. Hil. 197.	Inclosure and division of lands in the hamlet of Warningscamp.
Hereford	Bodenham	53 Geo. 3. 1813. Trin. 7.	Inclosure and division of the common fields in Bodenham.

No. 1a.—King's Bench and Common Pleas—*continued.*

County.	Parish or Place.	Reference to the Enrolment.	Particulars.
Essex	Elsenham	53 Geo. 3. 1813. Trin. 122.	Certain lands in Elsenham.
Buckingham	Newton Blossomville	53 Geo. 3. 1813. Trin. 139.	Inclosure of lands in Newton Blossomville.
Essex	Roydon	54 Geo. 3. 1813. Mich. 34.	Messuage, &c., in Roydon.
Surrey	St. Mary Magdalen, Bermondsey.	54 Geo. 3. 1813. Mich. 71.	Messuages, warehouses, and ground on the east side of Bermondsey Street.
Westmoreland.	Kirkby in Kendal	54 Geo. 3. 1814. Trin. 50.	Inclosure of a field called "Mint's Feet."
Suffolk	Battisford	54 Geo. 3. 1814. Trin. 61.	Inclosure of a common or waste ground called Battisford Tye.
Cumberland	Crosthwaite	55 Geo. 3. 1814. Mich. 41.	Inclosure of certain lands in Thoruthwaite.
Southampton	East Bere	55 Geo. 3. 1814. Mich. 74.	For disafforesting the forest of South, otherwise East Bere, otherwise Bier.
Cambridge	Kertling, Ashley cum Silverley.	55 Geo. 3. 1815. Hil. 114.	Inclosure and division of lands within the manors of Kertling and Ashley cum Silverley.
Cambridge	Kertling and Ashley cum Silverley.	55 Geo. 3. 1815. Hil. 138.	
Northampton	Blisworth	55 Geo. 3. 1815. Trin. 58.	Inclosure of lands in Blisworth.
Southampton	Parkhurst	55 Geo. 3. 1815. Trin. 80.	For disafforesting the forest of Parkhurst, and inclosing the open and common lands.
Devon	Plymstock	56 Geo. 3. 1815. Mich. 25.	Part of the manor of Stoddiscombe.
Wilts	Wokingham	56 Geo. 3. 1815. Mich. 42.	Inclosure of lands in the manor of Ashridge.
Buckingham	Stewkley	56 Geo. 3. 1815. Mich. 61.	Inclosure of lands in Stewkley.
Essex	Boxtead	56 Geo. 3. 1816. Hil. 58.	Inclosure and division of lands within the manor of Boxtead.
Oxford	Culham	56 Geo. 3. 1816. Hil. 114.	Inclosure and division of lands within the manor of Culham.
Oxford	Newington	56 Geo. 3. 1816. Hil. 125.	Inclosure of lands within the liberty of Berrick Prior.
Oxford	Cuddesdon	56 Geo. 3. 1816. Trin. 41.	Inclosure of lands within the hamlet and chapelry of Whcatley.
Surrey	Horley	56 Geo. 3. 1816. Trin. 65.	Inclosure of lands within the manor of Horley.
Surrey	St. John's, Southwark	56 Geo. 3. 1816. Trin. 95.	Certain lands on the east and west sides of Queen Street.
Buckingham	Augmondesham, otherwise Amersham.	57 Geo. 3. 1817. Hil. 2.	Inclosure of lands in Amersham.
Berks	Streatley	57 Geo. 3. 1817. Hil. 68.	Inclosure of lands in Streatley.
Kent	Lewisham	57 Geo. 3. 1817. Trin. 1.	A piece of land next to the churchyard of Lewisham.
Gloucester	Clifton	57 Geo. 3. 1817. Trin. 24.	Houses, gardens, and land in Clifton.
Middlesex	St. Mary's, Islington	57 Geo. 3. 1817. Trin. 43.	Messuage or inn known by the name or sign of the "Angel," with certain lands in Isledon, alias Islington.
Surrey	St. John's, Southwark	57 Geo. 3. 1817. Trin. 105.	A piece of land on the north side of Dockyard Street.
Sussex	Eartham	57 Geo. 3. 1817. Trin. 118.	Inclosure of lands in the manor of Eartham.
Surrey	St. John's, Southwark	58 Geo. 3. 1817. Mich. 9.	A piece of land in Thornton Street.
Middlesex	Harrow	58 Geo. 3. 1818. Hil. 79.	Inclosure and division of the open fields, common, and waste grounds in Harrow.
Suffolk	East Bergholt	58 Geo. 3. 1818. East. 46.	Inclosure of certain lands in East Bergholt.
Northumberland.	Semonburn	59 Geo. 3. 1819. Hil. 2.	Inclosure of lands in Semonburne.

No. 1a.—King's Bench and Common Pleas—*continued.*

County.	Parish or Place.	Reference to the Enrolment.	Particulars.
Essex - -	Southweald - - -	59 Geo. 3. 1819. Hil. 36.	Inclosure of lands within the manor of Southweald.
Northumberland.	Bywell, St. Petre - -	59 Geo. 3. 1819. East. 2.	Inclosure of lands in Bywell.
Leicester -	Great Sheepey - -	60 Geo. 3. & 1 Geo. 4. 1820. Hil. 31.	Inclosure and division of certain lands within the township of Great Sheepey.
Bucks - -	Upton-cum-Chalvey -	1 Geo. 4. 1820. East. 50.	Inclosure of lands in Upton-cum-Chalvey.
Essex - -	Pebmarsh, Matching, Balingdon.	1 Geo. 4. 1820. Trin. 8.	Certain messuages and lands in Pebmarsh, Matching, and Balingdon.
Hereford -	Mardon, Sutton, St. Michael, Sutton, St. Nicholas, and Withington.	1 Geo. 4. 1820. Trin. 50.	Inclosure of lands in Mardon, Sutton, and Withington.
Hereford -	The same - - - -	1 Geo. 4. 1820. Trin. 203.	The same.
Westmoreland.	Kendal - - - -	1 Geo. 4. 1820. Trin. 236.	Lands surrounding the chapel of Underbarrows.
Lincoln -	Haburgh - - - -	1 Geo. 4. 1820. Trin. 249.	Inclosure of lands.
Essex - -	Walthamstowe - -	1 Geo. 4. 1820. Mich. 49.	Certain lands forming part of Higham Bushes.
Warwick -	Solehull, Hampton, and Arden.	1 & 2 Geo. 4. 1821. Hil. 63.	Inclosure of the manor of Kowle.
Derby - -	Youlgrave - - -	3 Geo. 4. 1822. Trin. 66 and 79.	Inclosure of lands within the township of Elton and Winster.
Norfolk -	Owby, Ashby, Thirne, Clipposby, Bastwick, and Kepps.	3 Geo. 4. 1822. East. 3.	The manor, messuages, and lands in Owby, &c.
Hertford -	Aldenham, St. Peter's and St. Stephen's.	3 Geo. 4. 1822. Mich. 39.	The manor or lordship of Park, otherwise Parkhurst.
Bucks - -	Stoke Poges and Wrexham.	3 & 4 Geo. 4. 1823. Hil. 2.	Inclosure of lands in Stoke Poges and Wrexham.
Surrey - -	Addington - - -	3 & 4 Geo. 4. 1823. Hil. 133.	Certain land on the north side of the road leading from Croydon to Wickham.
Sussex - -	Fernehurst or Farnhurst	4 Geo. 4. 1823. Trin. 24.	Certain lands known by the names of "the Ropes, the Kerns, and the Hums," with glebe lands.
Hertford -	Aldenham, St. Peter's and St. Stephen's.	4 Geo. 4. 1823. Mich. 70.	The manor of Park, with messuages, farms, &c., called Parkbury Estate.
Suffolk - -	Leiston and Theberton -	5 & 6 Geo. 4. 1825. Hil. 22.	Inclosure of lands in Leiston and Theberton.
Hertford -	Cheshunt - - -	6 Geo. 4. 1825. Trin. 35.	Certain lands of the manor of Theobalds.
Hertford -	Cheshunt - - -	6 Geo. 4. 1825. Trin. 68.	Tenements and land on the east side of Turner's Hill.
Bucks - -	Clifton Reynes - -	7 Geo. 4. 1826. East. 6.	Inclosure of lands in Clifton Reynes.
Suffolk - -	Ramsholt and Alderton	7 Geo. 4. 1826. East. 57.	Payton Hall Farm.
Suffolk - -	Clopton - - - -	7 Geo. 4. 1826. Mich. 34.	Farmhouse known as Goldsbury Farm.
Suffolk - -	Alderton and Hollesley -	7 Geo. 4. 1826. Mich. 47.	Mansion house and farm house known by the name of Segenhoe.
Middlesex -	Hampton - - -	7 & 8 Geo. 4. 1827. Hil. 21.	Inclosure of lands in Hampton.
Oxford - -	Bampton - - - -	8 Geo. 4. 1827. East. 15.	Inclosure of lands in Bampton.
Hertford -	Aldenham, St. Stephen	8 Geo. 4. 1827. Trin. 10.	The manor of Oakhurst.
Hertford -	Rickmansworth - -	8 Geo. 4. 1827. Trin. 52.	The manor or reputed manor of Woodwick or Woodwick Farm, in the hamlet of West Hide.
Devon - -	Mamhead, Dawlish, Bishop Staynton, Ashcombe and East Teignmouth.	8 Geo. 4. 1827. Mich. 36.	The manor or lordship of Mamhead, also the manor or lordship of Ashcombe.

No. 1b.—Chancery.

List of Plans annexed to Inclosure Awards only.—31 George 2, 1757, to 7 William 4, 1837.

County.	Parish or Place.	Reference to the Enrolment.	Particulars.
		Close Rolls.	
Southampton	Barton Stacy	31 Geo. 2. 1757-8. Part 10, No. 13.	Inclosure and division of the common lands within the manor of Barton Stacy.
Nottingham	Clayworth	4 Geo. 3. 1764. Part 10, No. 10.	Inclosure and division of lands in Wiseton, in the parish of Clayworth.
Derby	Scropton	4 Geo. 3. 1764. Part 11, No. 11.	Inclosure and division of the common fields and waste grounds within the manor of Scropton.
Lincoln	Owston	32 Geo. 3. 1792. Part 31, No. 16.	Inclosure and division of the common fields in the parish of Owston.
Middlesex	Teddington	40 Geo. 3. 1800. Part 9, No. 6.	Inclosure and division of the common fields and wastes within the manor of Teddington, otherwise Todington, Tottington, or Tudington.
Suffolk	Iken	45 Geo. 3. 1805. Part 15, No. 14.	Inclosure and division of lands in the parish of Iken.
Norfolk	Potter Heigham	46 Geo. 3. 1806. Part 32, No. 2.	Inclosure, drainage, &c., of the common fields, marsh lands, and fens within the parish of Potter Heigham.
Hertford	Northaw	47 Geo. 3, 1807. Part 18, No. 11.	Inclosure and division of the waste and commonable lands within the parish of Northaw.
Oxford	Goring	53 Geo. 3. 1813. Part 26, No. 3.	Inclosure of Goring common or heath and other waste lands.
Lincoln	Brocklesby, Great Limber	55 Geo. 3. Part 78, No. 8.	Allotment and exoneration from tythes, of lands in the parishes of Brocklesby and Great Limber.
Lincoln	Cabourne	55 Geo. 3. 1815. Part 78, No. 9.	Inclosure of lands in Cabourne.
Berks	Beenham, Padworth	56 Geo. 3. 1816. Part 48, Nos. 5, 6.	Inclosure and division of lands in Beenham and Padworth.
Wilts	Winterbourne Monckton	56 Geo. 3. 1816. Part 47, No. 5.	Inclosure and division of lands in Winterbourne Monckton.
Berks	Windsor	57 Geo. 3. 1817. Part 20, No. 1.	Allotment to the King of the waste lands within the late forest of Windsor.
Gloucester	West Littleton	58 Geo. 3. 1818. Part 41, No. 13.	Inclosure and division of the common fields, &c., within the manor of West Littleton.
Suffolk	Walsham le Willows	1 Geo. 4. 1820. Part 63, No. 1.	Inclosure of lands in the parish of Walsham le Willows.
Berks	Thatcham	1 Geo. 4. 1820. Part 27, No. 7.	Inclosure of lands in the tythings or hamlets of Thatcham, Borough, Henwick, Colthrop, Parsonage, and Awbery Street, a common called Ham Marsh in the tything of Greenham, in the parish of Thatcham.
Northampton	New Borough	2 Geo. 4. 1821. Part 34, No. 12.	Inclosure, drainage, and improvement of the lands called Borough Fen Common and the Four hundred acre Common, for forming the same into a parish to be called "New Borough," and for building and endowing a church for such parish.
Salop	Norton in Hales	3 Geo. 4. 1822. Part 45, No. 1.	Inclosure of lands in the parish of Norton in Hales.
York	Sneaton	5 Geo. 4. 1824. Part 32, No. 13.	Inclosure of common and waste lands in the parish of Sneaton.
Berks	Marcham	8 Geo. 4. 1827. Part 24, No. 1.	Inclosure of lands within the township and parish of Marcham.
Essex	Orsett	1 Will. 4. 1837. Part 84, No. 1.	Inclosure, division, and improvement of waste grounds and fens within the manor of Orsett.
Sussex	Bosham, Funtington	1 Will. 4. 1837. Parts 207, 208.	Inclosure of lands in the parishes of Bosham and Funtington.

(Signed) John J. Bond.

No. 2.—Welsh Records.

Calendar of all Warrants, Signed Bills, and Privy Seals, of the Reigns of Hen. VII. and Hen. VIII., with one of Hen. VI. and one of Elizabeth: removed from Chester to the Public Record Office, in 1854.

Counties of Chester and Flint.

The following abbreviations are used:—W. Warrant; S. B. Signed Bill; P. S. Privy Seal.

59. Abell, John, Yeoman of the Prince of Wales' Chamber; to be Itinerant Bailiff of Cheshire. W. 4 Nov., 16 Hen. 7.
Almere, William; *see* Ralph Moreton. 6 Hen. 7.
11. Almor, John, Marshall of the King's Hall; having surrendered Patent, 10 Nov., 5 Hen. 7, granting him the office of Serjeant at Arms to Prince of Wales, at a daily wage of 12*d.*, is released from payment of 12*l.* due by him to the Chester Exchequer. W. 4 July, 7 Hen. 7.
Anderton; *see* John Sutton. 8 Hen. 8.
9. Annion, William, "Gladiator" of the Mayor of Chester; annuity of 66*s.* 8*d.* for life. W. 19 Jan., 6 Hen. 7.
41, 42, 43, 62. Anteknap, John, a Yeoman of the Prince of Wales' Chamber; to be Porter of the Castle of Flint. W. 20 Jan., 13 Hen. 7; P. S. 27 Jan., 13 Hen. 7; W. 16 Dec., 13 Hen. 7; Let. Patent, 1 Sept., 16 Hen. 7.
87. —— and Hugh Cholmondeley; to hold jointly the Office of Porter of the Castle of Flint, on surrender of Patent, 1 Sept., 16 Hen. 7, whereby John alone held the same Office. S. B. 16 Apr., 3 Hen. 8.
101. —— Yeoman of the King's Chamber; to be Porter of the Castle of Flint. S. B., 7 Hen. 8.
—— *see* John Grymesdich. 8 Hen. 8.
Appulton, Richard; *see* William Bedyll. 7 Hen. 8.
Arderne, Ralph; *see* John Carie. 22 Hen. 8.
177. —— William, one of the Grooms of the Queen's Chamber; to hold the office of Gauger of all vessels within the city, suburbs, and port of Chester, and of all creeks and passages thereto belonging; as lately held by John Holland, deceased. P. S. Greenwich, 10 July, (an. ?) Eliz. No. 1.
Ardwall, Richard; *see* Peter Mainwaring. 10 Hen. 8.
Arthur, Prince of Wales; *see* Scotland, People of; *see* William, Bishop of Lincoln. 15 Hen. 7.
Arundel, Philip; *see* Thomas, Earl of Derby. 6 Hen. 7.
Aston, — of Aston; *see* Ellen Manley. 13 Hen. 7
Atkins, John; *see* Henry Raynford. 11 Hen. 7.
Balfront, Henry; *see* Oliver Bolton. 9 Hen. 8.
Basford, Ralph, of Crew near Beotumlegh; *see* Peter Foulshurst. 9 Hen. 7.
Basingwerk, Thomas, Abbot of; *see* William, Bishop of Lincoln. 15 Hen. 7.
Baskervile, Peter, of Wynynton; *see* Peter Foulshurst. 9 Hen. 7.
Becket, Ralph; *see* Edward Snelson. 19 Hen. 8.
97. Bedyll, William, Henry Parker, and Richard Hawkyns; to be Auditors of Accounts for North Wales, Anglesea, Cheshire, and Flintshire, with the same powers and privileges as Roger Westwood and Richard Appulton, late Auditors, had; on surrender of Patent, 7 July, 6 Hen. 8; and of Patent under the Seal of the county of Chester, 15 July, 6 Hen. 8, whereby Henry Parker and Richard Hawkyns were appointed to hold the same office jointly; the said Patents being void by Act of Parliament held at Westminster, 5 Feb., 6 Hen. 8; which declares all Patents to be void, whereby an office is held jointly by any persons, provided none of them hold the same office by previous Letters Patent. P.S., 14 June, 7 Hen. 8.
123. Beeston, Ralph, Thomas, and Edward. By Inquisition taken at Chester, 9 Hen. 8, after the death of Tocherus Beeston, it was found, that Tocherus by his Charter dated 16 August, 9 Hen. 8, had granted to his sons Ralph and Thomas for life, a tenement in Ouston, of the annual value of 37*s.* 8*d.* then in the tenure of Richard Frere; also a yearly rent of 2*s.* issuing from a tenement in Kingley

No. 2.—Welsh Records : Warrants, Signed Bills, &c.—*continued.*

held of the King in capite of the yearly value of 37*s.* 8*d.*, then in the tenure of Roger Walton; also to his son Edward for life a tenement in Kingley in the tenure of John Hellesby, and a tenement in Norley in the tenure of Henry Hatton, both tenements being held of the King in capite, and worth yearly 20*s.* The remainders in all the above cases being to Tocherus and his heirs male. On payment of a fine of 59*s.* 8*d.*, pardon by the King for the above alienations being without licence. S. B., 7 Feb., 10 Hen. 8.

—— Thomas ; *see* preceding entry.

—— Edward ; *see* the same.

—— Tocherus ; *see* the same.

77. Belchier, Robert ; to have livery of lands as son and heir of Humphrey Belchier deceased. P. S., 20 Aug., 2 Hen. 8.

Berterton, manor of ; *see* Lawrence Dutton. 12 Hen. 7.

32. Birkenhead, Ralph ; to have custody of the lands of the late John Whitemore, with reversion of the lands which Marion late wife of William Whitemore, father of the late John, and Cecilia late wife of John, hold for life, in dower or otherwise, of the inheritance of John, son of John Whitemore, with wardship and marriage of John, son of John. W., 26 June, 12 Hen. 7.

56. Birkenhead, Ralph ; to be Rider of the Forest of Mara and Mondrem, Cheshire, with 3*d.* a day wages. W., 15 April, 15 Hen. 7.

—— Ralph ; *see* Sheriff of Cheshire. 16 Hen. 7.

83. —— Ralph ; to have wardship and marriage of Thomas, son and heir of Roger Booth, with custody of his lands. P. S., 19 Mar., 3 Hen. 8.

141. —— John, Ralph his son, and Henry his brother ; to be Clerks and Prothonotaries at all common pleas, assizes, gaol deliveries, &c., before the Justices in Cheshire and Flintshire, with custody of their Records and Rolls, on surrender of Patent, 15 Dec., 8 Hen. 8, whereby John Millett, deceased, and the aforesaid John held the same office in like manner as Adam Birkenhead, father of John, had previously held it. S. B., 8 Apr., 19 Hen. 8.

—— Ralph ; *see* preceding entry.

—— Adam ; *see* the same.

—— Henry ; *see* the same.

162. —— Henry and Richard Hurleton ; to be Serjeants at Law to the King in the county of Chester, with an annuity of five marks and other customary dues, on surrender of Patent, 22 Sept., 16 Hen. 8, granting the same office to William Claydon. 10 July, 34 Hen. 8.

—— Ralph ; *see* William Brereton. (An ?) Hen. 8.

Blackborne, Robert ; *see* Robert Warihull. 16 Hen. 7.

—— Humphrey ; *see* the same.

139. Blackbourn, Thomas ; to have licence to boil salt, and to sell it and other merchandise in the town of Middlewich. S. B., 3 Aug., 18 Hen. 8.

Bodyll, Galfridus ; *see* Hamo de Carrington. 36 Hen. 6.

120. Bolton, Oliver ; to be Master Carpenter on the King's works in Cheshire and Flintshire at a daily wage of 6*d.*, as lately held by Henry Balfront and Roger Druwry. S. B., 12 Mar., 9 Hen. 8.

157. —— Hugh ; to be Master Carpenter of the King's works in the counties of Chester and Flint, in the place of his father Oliver, deceased. S. B., 21 Dec., 29 Hen. 8.

—— Oliver ; *see* Hugh Bolton. 29 Hen. 8.

Booth, Thomas ; *see* Ralph Birkenhead. 3 Hen. 8.

—— Roger ; *see* the same.

Bostock, William ; *see* John Savage. 11 Hen. 7.

—— Ralph ; *see* John Savage. 12 Hen. 7.

—— William ; *see* the same.

—— Charles ; *see* Robert Warihull. 16 Hen. 7.

Boteras, Thomas ; *see* Robert Warihull. 16 Hen. 7.

Boughton, Lazar House at ; *see* Peter Mainwaring. 10 Hen. 8.

Bourbon, Duke of ; *see* Henry VIII. 16 Hen. 8.

Bradwall ; *see* Will. Venables. 6 Hen. 8.

Brandon, Charles ; *see* Anthony Kingston. 15 Hen. 8.

71. Bray, Sir Reginald ; to have the wardship and marriage of Ralph Massey, son and heir of John Massey, of the Hough, with custody of his lands ; the Escheator of Chester, Roger Mainwaring, to suffer him to receive the rents and profits of the lands, W. 5 Aug., (an. ?). Hen. 7.

—— Sir Reginald ; *see* Sir Richard Pole. 15 Hen. 7.

No. 2.—Welsh Records: Warrants, Signed Bills, &c.—*continued.*

152. Bream, Richard; grant to, for life, of the office of Keeper of Shotwyke Park, Cheshire, as formerly held by John Southwell and Peter Newton, with herbage and pannage therein; also of the office of Master of the Park and Hunt; also of a lease for life of the lordship and town of Shotwyke and fishery in the Dee, at a yearly rent of 24*l.* 3*s.* 4*d.* The above grants being in the King's hands by reason of the attainder for high treason of William Brereton, Groom of the King's Privy Chamber, to whom, jointly with Urian Brereton, the same grants were made by Patent, 8 June, 20 Hen. 8. P. S., Westminster, 1 June, 28 Hen. 8.

149. —— Richard, and John Massy; grant to, for life, of the office of Keeper of Shotwyke Park, Cheshire, with herbage and pannage therein; also of the office of master of the park and hunt; also of a lease for life of the lordship and town of Shotwyke and fishery in the Dee, at a yearly rent of 24*l.* 3*s.* 4*d.*, on surrender of Patent, 13 July, 28 Hen. 8, making the same grants to Richard Bream alone. P. S., Westminster, 21 February, 28 Hen. 8.

50. Brereton, Sir Ranulph; grant of the next presentation of a moiety of the Church of Malpas, belonging to Arthur, Prince of Wales, by reason of the death of Sir Thomas Cokesey, when it shall be vacant by the death of its present rector, Henry Raynford. W., 21 Nov., 14 Hen. 7.

—— Hugh; *see* Sheriff of Cheshire. 16 Hen. 7.

—— Roger; *see* James Worsley. 2 Hen. 8.

104. —— Sir William, Sir George Holford, William Wilbraham, John Glegge, Richard Leftwich, and John Tatton, having been commissioned by the King to collect all arrears of a sum of 3,000 marks of a fine granted to the late King Henry VII. by the inhabitants of Cheshire in return for Letters Patent of confirmation of their liberties and pardon of offences; warrant to Sir Randolph Brereton, Chamberlain of Cheshire, to let the Commission have access to Records, &c., of receipt and the books of assessment of Sir Thomas Englefield in the Exchequer at Chester, and to make a full declaration to the Commission of all the Chamberlain has received. 19 Apr., 7 Hen. 8.

—— Sir Randolf; *see* preceding entry.

106. —— Sir William; to have wardship and marriage of Edward, son and heir of Robert Foulshurst, of Nantwich, with custody of his lands. S. B., 14 May, 7 Hen. 8.

131. —— Roger, Sewer of the King's Chamber; to have reversion of the office of Bailiff of the hundred of Broxum, Cheshire, now held by Edward ap John. S. B., 27 Feb., 15 Hen. 8.

136. —— Roger, gentleman; to be Bailiff of the King's domain of Draklowe and Rud heath, with the usual annual fee of 3*l.* 0*s.* 10*d.* and other customary profits; also to be Bailiff of the hundred of Nantwich, on surrender of Patent, 8 Apr., 7 Hen. 8, whereby Thomas Sonde, yeoman of the King's Guard, held the first of the above-named offices, and of Patent, 1 July, 7 Hen. 8, whereby Thomas held the second. S. B., 22 Jan., 17 Hen. 8.

143. —— Ranulph of Chester; to have reversion of the office of Clerk or Baron of the Exchequer of the county of Chester, now held by John Tatton by virtue of Patent, 4 July, 7 Hen. 8, appointing the said John and Nicholas Farrington (deceased) to hold the same office jointly. S. B., 12 May, 21 Hen. 8.

—— Ranulph; *see* Ranulph Lloyd. 23 Hen. 8.

—— Urian; *see* Richard Bream. 28 Hen. 8.

—— William; *see* the same.

156. —— John; to be Master Mason of the King's works in Cheshire and Flintshire. P.S., Manor of Hampton, 9 May, 29 Hen. 8, Letters Patent dated 14 May same year.

158. —— John; one of the gentlemen-ushers of the King's Chamber; to be Sheriff of Flintshire, on surrender of Patent, 17 June, 28 Hen. 8., granting the same office (then vacant by reason of the former Sheriff, William Brereton, being attainted for high treason) to Percival Harte, one of the Royal Sewers. P. S., 23 Apr., 30 Hen. 8. Letters Patent dated 30 Apr. same year.

—— William; *see* preceding entry.

160. —— Urian, a Groom of the King's Privy Chamber, and Roger Brereton, a Sewer of the King's Chamber; to hold the office of Sheriff of Flintshire, on surrender of Patent, 30 Apr., 30 Hen. 8, granting the same office to John Brereton, one of the gentlemen-ushers of the King's Chamber. P. S., 3 July, 30 Hen. 8.

No. 2.—Welsh Records: Warrants, Signed Bills, &c.—*continued.*

Brereton, Roger; *see* preceding entry.
—— John; *see* the same.

164. —— Urian, Groom of the King's Private Chamber, and Randall Cholmondeley; to be attorneys to the King in the counties of Chester and Flint, in like manner as Richard Sneyde formerly was, on surrender of Patent, 8 July, 30 Hen. 8, granting the same office to the said Urian and to Humphrey Hurleton, deceased. P. S., 10 May, 35 Hen. 8.

168. —— William, Groom of the King's Privy Chamber; to have reversion of the office of Escheator of Cheshire, with fee of 10*l.* per annum and all other profits thereto belonging, now held by Sir Ralph Egerton, Gentleman Usher of the King's Chamber, who was appointed thereto jointly with Roger Mainwaring, deceased, by Patent, 7 July, 1 Hen. 8; also reversion of the office of Ranger of the Forest of Delamere, with yearly wage of 4*l.* 11*s.* 3*d.* and all other profits thereto belonging, now held by the said Sir Ralph, who was appointed thereto on the decease of Ralph Birkenhead, by Patent, 24 Nov., 6 Hen. 8. S. B., (an. ?) Hen. 8.

169. —— Sir Ranulph; to have custody of the lands of the late Thomas Conwey, with wardship and marriage of his son and heir John. S. B., (an. ?) Hen. 8.

170. —— William, Yeoman of the King's Chamber; to be Comptroller of the Records in the counties of Chester and Flint. S. B., (an. ?) Hen. 8.

173. —— Thomas, Clerk; to be perpetual Vicar of the King's living of Over, in Cheshire. S. B., (an. ?) Hen. 8.

Bretain; *see* Sir Geo. Holford. (An. ?) Hen. 7.
Brigg, William, Clerk; *see* Roger Downes. 10 Hen. 8.

8. Broke, Robert, Deputy Bailiff of the lordship of Draklow and Rudheath; having been robbed of 11*l.* 6*s.* 8*d.* of money due to the Prince of Wales, warrant commanding no process to be commenced against him for its recovery. 16 Feb., 6 Hen. 7.

—— John; *see* Ralph Egerton. 16 Hen. 7.

161. —— Robert, gentleman; to have, for a fine of 20*l.*, a lease for 21 years of a corn mill and a fulling mill at Dee, with fishery in a pool there, called King's Pole, (corn mill and fishery being now in the occupation of Roland Goodman,) at a yearly rent of 85*l.*, on the expiration of a lease of the same, at the same rent, for a term of 30 years, commencing from 29 Sept. 1523, granted, by Patent, 1 Oct., 14 Hen. 8, to Nicholas Hurlton. P. S., 12 Apr., 32 Hen. 8.

47. Bromley, Thomas, gentleman; to hold the office of Vendor of the goods and chattels of felons, fugitives, and outlaws in Cheshire, and of intestate persons in Flintshire. W., 15 Dec., 13 Hen. 7.

—— George; *see* John Carie. 22 Hen. 8.
Brown, John, of Hatton; *see* Peter Foulshurst. 9 Hen. 7.
Broxon, Hundred of; *see* Edward ap John. 7 Hen. 8.
Broxum, Hundred of; *see* Roger Brereton. 15 Hen. 8.
Bryertonne, Randolf; *see* Henry VIII. 16 Hen. 8.
Buclowe, Hundred of; *see* Hamo de Carrington. 36 Hen. 6.
Bulkeley, Edmund; *see* Roger Mainwaring. 10 Hen. 7.
—— Edmund; *see* Sheriff of Cheshire. 16 Hen. 7.
—— Charles; *see* Edward Snelson. 19 Hen. 8.
Buoy, *alias* Byrre, Richard, of Northwich; *see* Peter Foulshurst. 9 Hen. 7.
Byron, Thomas; *see* Roger Downes. 10 Hen. 8.

165. Calveley, John, a Gentleman-at-Arms to the King; to hold for life the office of Ranger of the Forest of Delamere, with an annuity of 4*l.* 11*s.* 3*d.* and other customary dues, as lately held by Peter Dutton, deceased, and formerly by Sir Ralph Egerton, deceased. P.S. Windsor, 24 Sept., 37 Hen. 8.

144. Carie, John, a Groom of the King's Privy Chamber; grant to him of a fine of 20*l.* to be levied on Ralph Ardern, Esq., Urian Dymmok, of Chester, George Holforde, Gent., and Robert de la Hay, who were bound by George Bromley, Deputy Justice of Cheshire, as sureties for Richard Coppok, of Norden, Cheshire, husbandman, indicted of murder and outlawed. P. S., York Place, 20 Sept., 22 Hen. 8.

1. Caryngton, Hamo de; to have a lease of the hundred of Buclowe, with the office of Bailiff and Beadle thereof, for three years, at 7*l.* 6*s.* 8*d.* per annum, to be paid to Edward, Prince of Wales, by the hands of John Savage, jun., Galfridus Bodyll, and Richard Hyll, of Kenworthya. Signed, John Morton, Chancellor, and Robert Whitingham, Receiver-General of the Prince of Wales. Directed to Sir Richard Tunstall, Chamberlain of Chester. 16 Nov., 36 Hne. 6.

No. 2.—Welsh Records : Warrants, Signed Bills, &c.—*continued.*

13. Caterall, John ; to hold for life the office of Rider of the Forest of Mara and Mondrem, Cheshire. W., 18 Jan., 7 Hen. 7.
64. —— John ; to have annuity of 10 marks for life. W., 4 Oct., 16 Hen. 7.
Chaloner, John ; *see* William, Bishop of Lincoln. 15 Hen. 7.
—— John ; *see* Sir Thomas Cokesey. 15 Hen. 7.
166. Chalener, John, and others ; commissioned to decide the litigation between Sir William Troutbek and Sir John Downe, touching the moiety of the office of Master Forrester of Delamere Forest. P. S., Richmond, 26 May, (an. ?) Hen. 8.
Chantrell, Robert ; *see* Sheriff of Cheshire. 16 Hen. 7.
Cheshire ; *see* Thomas Stanley. 8 Hen. 7.
—— ; *see* William, Bishop of Lincoln. 12 Hen. 7.
48. —— Sheriff of ; to issue a general proclamation of summons to attend before the Justices in Eyre at Chester, on the Thursday following the Feast of St. Bartholomew next ensuing. W., Beawdeley, 14 Hen. 7.
60. —— Sheriff of ; allowance to be made to him by the Auditors of the county of Chester for the following sums of money in his next account to them :—10 marks due from Hugh Brereton ; 100*s.* from Edmund Bulkeley and Robert Chantrell ; 67*s.* 8*d.* from Thomas Starky ; 8*l.* from Robert Litdover, and 14*l.* 13*s.* 3*d.* from Thomas Fouleshurst, being fines for offences against the laws, but which Sir Richard Pole, Chamberlain, and others, appointed Commissioners to examine the records of fines, report cannot for divers causes be levied ; also 40*l.* for Sheriff's expenses at Sessions ; 26*l.* 13*s.* 4*d.* for expenses of Ralph Birkenhead, Undersheriff, and 40*s.* for those of his servant Nicholas Farington. W., Beaudeley, 13 March, 16 Hen. 7.
—— ; *see* John Abell. 16 Hen. 7.
9. Chester, Coventry and Lichfield, William Smyth, Bishop of ; restitution of temporalities within county of Chester, they having been taken into the Prince of Wales' hands on an inquisition, after the death of John, late Bishop, taken before Sir Thomas Wolton, Escheator of Cheshire. 6 Hen. 7. W., 13 Feb., 8 Hen. 7.
67. —— House of the Friars Preachers in ; inspeximus and confirmation of an allowance of 8*l.* 13*s.* 4*d.* a year, formerly granted them by Ranulph, Earl of Chester. W., 10 Feb., 16 Hen. 7.
—— Castle ; *see* Ralph Egerton. 3 Hen. 8.
Cheyvelegh ; *see* Abbot of Saint Werburgh. 6 Hen. 8.
125. Cholmeley, Sir Richard, Edward Molyneux, Clerk, Richard Hassall, gent., and Richard Williamson, Clerk ; to have wardship and marriage of Richard, son and heir of Richard Cholmondeley, Esq., with custody of his lands and those held to his use by reason of the attainder of Sir Francis Lovell, late Lord Lovell. S. B., 1 July, 12 Hen. 8.
Cholmondley, Richard ; *see* Anne Molyneux. 13 Hen. 7.
Cholmondeley, Hugh ; *see* John Anteknap. 3 Hen. 8.
—— Richard ; *see* Cholmeley, Sir Richard. 12 Hen. 8.
—— Randal ; *see* Urian Brereton. 35 Hen. 8.
Clarke, Thomas ; *see* Saint Werburgh. 29 Hen. 8.
Clayton, William ; *see* Henry Birkenhead. 34 Hen. 8.
Clifford, Henry ; *see* Henry VIII. 16 Hen. 8.
Clifton Park, Cheshire ; *see* Robert Lawrence. (An. ?) Hen. 8.
Coke, John ; *see* Robert Wode. 4 Hen. 8 ; 12 Hen. 8.
Cokesey, Sir Thomas ; *see* Sir Ranulph Brereton. 14 Hen. 7.
53. —— Sir Thomas ; Arthur, Prince of Wales, to the Chamberlain of Cheshire, commanding him to issue letters of commission to Robert Frost, Chancellor to the Prince, Sir Richard Pole, Chamberlain, Thomas Englefield, Deputy of the Justice of Cheshire, and John Chaloner, to make inquisition touching the lands of the late Sir Thomas Cokesey. W., 16 Aug., 15 Hen. 7.
108. Colbrond, George ; to have an annuity of 4*l.* for life. S. B., 25 Feb., 8 Hen. 8.
Conwey, John ; *see* Sir Ranulph Brereton. (An. ?) Hen. 8.
—— Thomas ; *see* the same.
Coppok, Richard, of Norden ; *see* John Carie. 22 Hen. 8.
Cornewale, Sir Thomas ; *see* Henry VIII. 16 Hen. 8.
93. Cotton, Richard ; being bound by a recognizance to appear in Court on a certain day, in the matter of a suit between him and William Venables for a piece of land, licence for him to defer the day. W., 15 June, 5 Hen. 8.
Coventry and Lichfield, John, Bishop of ; *see* William, Bishop of Lincoln. 12 Hen. 7.
Croft, Sir Richard ; *see* William, Bishop of Lincoln. 12 Hen. 7.
Cross, Ralph ; *see* Edward Snelson. 19 Hen. 8.

No. 2.—Welsh Records : Warrants, Signed Bills, &c.—*continued.*

Croxton ; *see* John Pownall. (An. ?) Hen. 7.

138. Croxston, George ; to be a Burgher of Middlewich, with licence to boil salt, and sell it and other wares. S. B., 23 Aug., 17 Hen. 8.

98. Cunne, John ; to have an annuity of 4*l.* for life. S. B., 4 Oct., 7 Hen. 8.

—— John ; *see* Thomas Pulford. 30 Hen. 8.

Curtsehobne ; *see* William Venables. 6 Hen. 8.

Danyell, Peter ; *see* Peter Newton. 14 Hen. 7.

—— Thomas ; *see* the same.

Darcy, Thomas ; *see* Henry VIII. 16 Hen. 8.

112. Darwall, Seth ; to be Master Mason of the King's works in Cheshire and Flintshire, with a daily pay of 5*d.* S. B., 10 Sept., 8 Hen. 8.

137. —— Seth, and George, his son ; appointed to the office of Master Mason of the King's works in Cheshire and Flintshire, with a daily pay of 5*d.*, on surrender of Patent, 10 Sept., 8 Hen. 8, granting the same to Seth alone. S. B., 1 Aug., 17 Hen. 8.

—— George ; *see* last entry.

Daune, Sir John, of Utkinton ; *see* Ellen Manley. 13 Hen. 7.

Davenport, Richard ; *see* Edward Snelson. 19 Hen. 8.

103. Davy, William ; to have an annuity for life of 4*l.*. S. B., 8 March, 7 Hen. 8.

Dee ; *see* Hurleton, Nicholas. 14 Hen. 8.

—— Fishery in ; *see* Richard Bream. 28 Hen. 8.

—— *see* Broke, Robert. 32 Hen. 8.

Delamere, Forest of ; *see* Calveley, John. 37 Hen. 8.

—— Forest of ; *see* John Chalener. (An. ?) Hen. 8.

—— Forest of ; *see* William Brereton. (An. ?) Hen. 8.

7. Derby, Thomas, Earl of, George Stanley, Lord le Strange, Sir William Stanley, ..., Philip Arundell, Chancellor, Thomas Englefield, Lieutenant of Cheshire, and Robert Sherborne, Clerk ; Commission for them to levy aid within Cheshire for the King's expedition to France. W., 21 Aug., 6 Hen. 7.

—— Thomas, Earl of ; *see* William, Bishop of Lincoln. 12 Hen. 7.

—— Earl of ; *see* Peter Newton. 12 Hen. 7.

—— Thomas Stanley, Earl of ; *see* Sir Thomas Englefield. 2 Hen. 8 ; 5 Hen. 8.

Dokenfeld, Robert ; *see* John Pownall. (An. ?) Hen. 7.

Done, Richard ; *see* Sir William Tiler. 9 Hen. 8.

—— John ; *see* the same.

Dorset, Thomas, Marquis of ; *see* William, Bishop of Lincoln. 12 Hen. 7.

49. Downe, Roger and Richard, of the hundred of Macclesfield ; to be released from their bond to keep the peace. W., Monastery of St. Werburgh, Chester, 15 August, 14 Hen. 7.

—— Sir John ; *see* John Chalener. (An. ?) Hen. 8.

124. Downes, Roger, Esq., William Brigg, Clerk, Thomas Byron, Richard Willott, Cecilia Worth, widow, and Leonard, younger son of the late John Worth ; to have letters of pardon, on the payment of a fine of 17*l.* to Sir John Heron, Treasurer, for the alienation to them without licence of the manor of Tuderington, and certain messuages and lands in Tuderington and Hurdfield, in Cheshire, held of the King as Earl of Cheshire. S. B., Chester, 27 July, 10 Hen. 8.

Draklow and Rudheath ; *see* Henry Wright, 12 Hen. 7 ; and Robert Broke, 6 Hen. 7.

—— King's domain of ; *see* Roger Brereton. 17 Hen. 8.

—— *see* Thomas Sonde, 2 Hen. 8 ; John Mainwaring, 2 Hen. 8 ; Thomas Sonde, (an. ?) Hen. 8.

Druwry, Roger ; *see* Oliver Bolton. 9 Hen. 8.

40. Dutton, Jane, late wife of Roger, claims by traverse the manor of Weston for life ; the claim to be allowed on payment of a fine of 20*l.* W., Westminster, 22 Feb., 12 Hen. 7.

35. —— Lawrence ; to hold, during pleasure, the manors of Nesse and Berterton, Cheshire, at a yearly rent of 100*s.* W., Westminster, 22 Feb., 12 Hen. 7.

44. —— Lawrence, Esq. ; to have livery of lands, as son and heir of Roger Dutton, Esq., and heir of Sir Thomas Dutton, brother of Roger, and heir of John and Peter, sons of Sir Thomas. W., Ludlow Castle, 21 March, 13 Hen. 7. Pledges for relief, Richard Leftwich and John Dutton, of Altrincham.

—— Roger ; *see* last entry.

—— John ; *see* the same.

—— Peter ; *see* the same.

—— Sir Thomas ; *see* the same ; and Anne Molyneux. 13 Hen. 7.

No. 2.—Welsh Records: Warrants, Signed Bills, &c.—*continued.*

Dutton, Peter; *see* John Calveley. 37 Hen. 8.
Dymmok, Urian; *see* John Carie. 22 Hen. 8.
Eccleston; *see* William Venables. 6 Hen. 8.
Eddesbury, Hundred of, Cheshire; *see* Robert Wood. 7 Hen. 8; 12 Hen. 8; 25 Hen. 8.
65. Eggerton, Ralph, Marshall of the Prince of Wales' Court; to have wardship and marriage of Roger, son and heir of John Wetenhall, with custody of his lands and custody in reversion of the lands held by Matilda, late wife of the said John, and by Robert Sadler, John Broke, and Johanna his wife, for life or for a term of years. W., 1 July, 16 Hen. 7.
85. —— Ralph, and Thomas Grimesditch; to have the office of Porter of the Outer Gate of Chester Castle. P. S., Windsor, 13 Oct., 3 Hen. 8.
—— Sir Ralph; *see* Henry VIII. 16 Hen. 8.
—— Ralph; *see* Francis Sidney. 17 Hen. 8.
—— Sir Ralph; *see* John Calveley. 37 Hen. 8.
—— Sir Ralph; *see* William Brereton. (An.?) Hen. 8.
—— Sir Ralph; *see* Anthony Knyvett. (An. ?) Hen. 8.
79. Ener, John Mainwaring ap., Squire of the King's Body; to be Bailiff of Drakelowe and Rudheath. P. S., Westminster, 12 Feb., 2 Hen. 8.
Englefield, Thomas; *see* William, Bishop of Lincoln, 12 Hen. 7; Thomas, Earl of Derby, 6 Hen. 7.
—— Thomas, Esq.; *see* Sir Thomas Englefield, 5 Hen. 8; and John Royden, 11 Hen. 7.
—— Thomas; *see* Sir Thomas Cokesey. 15 Hen. 7.
80. —— Sir Thomas; to hold the office of Justice of the counties of Chester and Flint, as formerly held by Thomas Stanley, Earl of Derby, and George Lord Le Strange, his son, deceased. S. B., 23 March, 2 Hen. 8.
92. —— Sir Thomas, and Thomas his son; to hold the office of Justice of the counties of Chester and Flint, as formerly held by Thomas, Earl of Derby, and his son George Lord Le Strange, deceased, on surrender of Patent, 23 March, 2 Hen. 8, granting the same office to Sir Thomas Englefield alone. S. B., 10 June, 5 Hen. 8.
—— Sir Thomas; *see* Sir William Brereton. 7 Hen. 8.
Erdeswik, Manor of; *see* John Pownall. (An.?) Hen. 7.
Eyre, Robert; *see* Robert Warihull. 16 Hen. 7.
Farrington, Nicholas; *see* Sheriff of Cheshire. 16 Hen. 7.
—— Nicholas; *see* Ranulph Brereton. 21 Hen. 8.
Fitton, Thomas; *see* John Pownall. (An. ?) Hen. 7.
15. Fitzwarren, John Bourchier, Lord; to have livery of the manor of Newhall, Cheshire, as son and heir of Fulk Bourchier, late Lord Fitzwarren. W., 13 Feb., 8 Hen. 7.
—— Fulk Bourchier, Lord; *see* preceding entry.
Flintshire; *see* John Royden. 11 Hen. 7.
—— *see* William, Bishop of Lincoln, 12 Hen. 7; Thomas Stanley, 8 Hen. 7; and Anthony Knevett, (an. ?) Hen. 8.
Flint, Castle of; *see* John Anteknap, 3 Hen. 8, 7 Hen. 8; Grimesditch, John, 8 Hen. 8; Sir Sampson Norton, 8 Hen. 8.
—— *see* John Norton. 8 Hen. 8.
21. Foulshurst, Peter, of Crew, near Beotumlegh, gentleman; Thomas Williamson, of Cholley, husbandman, alias of Hatton, yeoman; Richard Tilston, of Huxley, yeoman; Richard Buoy, of Northwich, harper, alias Richard Byrre, of Northwich, yeoman; Jacob Frodsham, of Wenynton, yeoman; Peter Baskervile, of Wynynton, yeoman; John Brown, of Hatton, labourer; Edward Wiche, of Northwich, yeoman; John Runcorn, of Northwich, yeoman; Geoffrey Legh, of Marthall, gentleman; and Ralph Basford, of Crew, near Beotumlegh, yeoman; pardon for all offences previous to this day. W., 8 Oct., 9 Hen. 7.
—— Thomas; *see* Sheriff of Cheshire. 16 Hen. 7.
70. —— Robert; livery of lands to, as son and heir of Thomas son of Sir Robert Fouleshurst. W., 8 Sept., (an. ?) Hen. 7.
—— Sir Robert; *see* preceding entry.
—— Thomas; *see* the same.
—— Robert, of Nantwich; *see* Sir William Brereton. 7. Hen. 8.
—— Edward; *see* the same.
Fovell, John; *see* Robert Warihull. 16 Hen. 7.
172. Fowler, Peter, Clerk; to have annual salary of 10*l.* (which Edward Pennand, Clerk, lately had) for performing divine service in the chapel of St. Wenefrede, Holy-

No. 2.—Welsh Records : Warrants, Signed Bills, &c.—*continued.*

well, Flintshire, on surrender of Patent 1 Feb., 16 Hen. 8, granting the same to Owen Hensheman, Clerk. S. B., (an. ?) Hen. 8.

119. Fraunceys, David, having been made Bailiff Arrant of the hundred of Wirall, Cheshire, an office he cannot lawfully enjoy ; grant to him of an annuity for life of 40*s.* S. B., 24 Oct., 9 Hen. 8.

Francis, David ; *see* Ralph Worsley. 16 Hen. 8.

Francis I. ; *see* Henry VIII. 16 Hen. 8.

Frere, Richard ; *see* Ralph Beeston. 10 Hen. 8.

Frodsham, Jacob, of Wenynton ; *see* Peter Foulshurst. 9 Hen. 7.

Frodsham, manor of; *see* Peter Newton. (An. ?) Hen. 7.

22. Frost, Walter, Esq. ; to be Receiver of Macclesfield. W., Ludlow Castle, 1 April, 10 Hen. 7.

—— Robert ; *see* William, Bishop of Lincoln. 12 Hen. 7.

—— Robert ; *see* William, Bishop of Lincoln, 15 Hen. 7 ; and Sir Thomas Cokesey, 15 Hen. 7.

69. —— Robert ; to be Supervisor of all the Royal domains in Cheshire. W., (an.?) Hen. 7.

142. Gage, Sir John ; grant to, of an annuity of 40*l.* for life, in the place of Sir Thomas Kynaston, deceased. S. B., 4 April, 19 Hen. 8.

Glegge, John ; *see* Sir William Brereton. 7 Hen. 8.

Goodman, Roland ; *see* Robert Broke. 32 Hen. 8.

Gosworth ; *see* John Sutton. 8 Hen. 8.

Great Budworth ; *see* Budworth, Great.

Green, John, son of Ralph, of Goosetree ; *see* Matthew Tabley. (An.?) Hen. 7.

Griffith, John ; *see* William Masterton. 12 Hen. 7.

84. Griffith, Peter, Yeoman of the King's Guard ; to be Porter of the Castle of Rutland, Flintshire, in the place of Richard Newbolt. S. B., Westminster, 8 March, 3 Hen. 8.

Grimesdich, Thomas ; *see* Ralph Egerton. 3 Hen. 8.

—— Hugh, Bailiff of the hundred of Nantwich ; *see* Thomas Sonde. 7 Hen. 8.

109. Grymesdich, John, Groom of the King's Chamber ; to be Porter of the Castle of Flint, in the place of John Anteknap, deceased. S. B., 1 Dec., 8 Hen. 8.

Harper, Robert ; *see* Anthony Kingston. 15 Hen. 8.

Harte, Percival ; *see* John Brereton. 30 Hen. 8.

Hassall, Richard ; *see* Sir Richard Cholmeley. 12 Hen. 8.

Hatton, Henry ; *see* Ralph Beeston. 10 Hen. 8.

Hawkins, Richard ; *see* William Bedill. 7 Hen. 8.

116. Hay, Robert de la; to have a lease for life of the tolls of markets and fairs held in the borough of Macclesfield at the Feast of All Saints and St. Barnabas, with pannage of pigs, in the forest of Macclesfield, at a yearly rent of 19*s.* 8*d.*; also to hold the office of Coroner of the hundred of Macclesfield, on surrender of Patent, 1 Sept., 6 Hen. 8, granting the same lease on the same terms to Hugh Manifold, and of Patent, 14 July, 7 Hen. 8, granting the said Hugh the office of Coroner. S. B., 21 June, 8 Hen. 8.

—— Robert de la; *see* John Corie. 22 Hen. 8.

Hellesby, John; *see* Ralph Beeston. 10 Hen. 8.

134. Henry VIII. to Sir Thomas Cornewale, Sir Ralph Egerton, and other Commissioners for raising a voluntary aid or grant within the county of Chester for the King's use. Doubts not they have heard of the happy results of his assistance in men and money to the Duke of Bourbon and other great personages in Italy, in the defeat and captivity of the French King [Francis I.] and the King of Navarre [Battle of Pavia]; has consulted with his Council how to turn the victory to the best account; sends to them Randolf Bryertonne and Sir Ralph Egerton with instructions for them ; commands them to give the same credence to Henry Clyfford and Thomas Darcy as to himself. S. B., Greenwich, 21 March, 16 Hen. 8.

Hensheman, Owen ; *see* Peter Fowler. (An ?) Hen. 8.

Heppales, Lands in Torkington called; *see* Legh, John. 35 Hen. 8.

Heron, Sir John; *see* Roger Downes. 10 Hen. 8.

82. Hewst, John, merchant of Chester, having sustained loss in ships through the ruin and decay of the haven there, and having just built two new ships of 120 tons and 80 tons respectively, to have a grant of 4*s.* for every ton burden of each of the same ships. P. S., Greenwich, 7 April, 3 Hen. 8.

Hill, Richard; *see* Hamo de Caryngton. 36 Hen. 6.

150. Holand, John; to be Gauger within the city and port of Chester. P. S., Greenwich, 3 Aug., 28 Hen. 8.

No. 2.—Welsh Records: Warrants, Signed Bills, &c.—*continued.*

Holand, John; *see* William Arderne. (An ?) Eliz.
Holford, Charles; *see* Ralph Moreton. 6 Hen. 7.

74. —— Sir George; being bound in the sum of 500 marks to appear before the Exchequer of Chester next Michaelmas, the same to be deferred till his return from serving in the King's army in the parts of Bretain. S.B., Westminster, 26 Feb., (an ?) Hen. 7.

—— Sir George; *see* Sir William Brereton. 7 Hen. 8.
—— George; *see* John Carie. 22 Hen. 8.
Howard, Sir Edward; *see* Anthony Kingston, 15 Hen. 8.

18. Hulse, William, gentleman, of Dartford, Kent, alias, of Norbury, Cheshire, alias, of Whitechurch, Shropshire; pardon for all offences previous to 7 Nov., 8 Hen. 7. W., Wigmore Castle, 29 July, 8 Hen. 7.

Huntingdon, Cheshire; *see* Abbot of Saint Werburgh. 6 Hen. 8.
Hurdfield; *see* Roger Downes. 10 Hen. 8.
Hurleton, Hugh; *see* John Pownall. (An ?) Hen. 7.

127. —— Nicholas; to have a lease of corn mill and a fulling mill at Dee, and a fishery called the Kingespole, for 30 years, at a rent of 85*l.* per annum, on surrender of Patent, 5 June, 6 Hen. 8, granting the same lease on the same terms to the said Nicholas for a term of 31 years. P. S., Manor of More, 29 July, 14 Hen. 8.

—— Nicholas; *see* Robert Broke. 32 Hen. 8.
—— Richard; *see* Henry Birkenhead. 34 Hen. 8.
—— Humphrey; *see* Urian Brereton. 35 Hen. 8.

105. John, Edward ap, having by Patent, dated 10 April, 4 Hen. 8, been appointed to the office of Bailiff of the hundred of Broxon, Cheshire, on its surrender is re-appointed to the same office, all previous debts and arrears being remitted to him. S. B., 20 July, 7 Hen. 8.

—— Edward ap; *see* William Pole. 8 Hen. 8.
—— Edward ap; *see* Roger Brereton. 15 Hen. 8.

52. Kebell, Thomas, and John Mordaunt, Serjeants-at-Law; to be Justices in Eyre within the county of Chester. W., Beawdeley, 14 Hen. 7.

61. Kent, George Earl of; custody of all the possessions in Cheshire and Flintshire of the late Sir William Trussell, which have come into the King's hands by reason of the minority of Edward son of the aforesaid William, and after Edward's death by reason of the minority of his son John, and on his death by reason of the minority of the aforesaid Edward's daughter Elizabeth, with right of presentation to the Church of Wermyncham in Cheshire, now vacant. W., Chester, 13 Sept., 16 Hen. 7.

Kinderton; *see* William Venables. 6 Hen. 8.
Kingley; *see* Ralph Beeston. 10 Hen. 8.

129. Kingston, Anthony, and Dorothy his wife. Robert Harper died seised of lands in Cheshire held of the late King Hen. 7, as Earl of Chester, as appeareth by Inquisition taken in the 24th year of his reign. Robert had issue Dorothy, within age at her father's death. She and her lands were assigned to the custody of Sir Edward Howard and Charles Brandon, with whose consent she married Anthony Kingston, and, after that, was proved of the full age of 14 years on 11 Oct., 12 Hen. 8. On 14 Nov. of that year livery was made to her of her lands; but that livery having been sued in the name of Dorothy alone, and not in that of her husband also, is insufficient in law. Pardon by the King for the same, and direction for the issue of a new writ of livery in both their names. S. B., 4 Aug., 15 Hen. 8.

176. Knyvett, Anthony; to hold the office of Sheriff of county of Flint, as lately held by Sir Ralph Egerton, deceased. S. B., (an ?) Hen. 8.

90. Kynaston, Sir Thomas; to have an annuity for life of 40*l.* S. B., 1 March, 5 Hen. 8.

137. —— Sir Thomas; to have an annuity of 40*l.* for life. S. B., 20 Feb., 7 Hen. 8.

—— Sir Thomas; *see* Sir John Gage. 19 Hen. 8.
Langley; *see* John Sutton. 8 Hen. 8.

174. Lawrence, Robert, "Groom for your mouth in your panatrye;" to be Keeper of the Park of Clifton, Cheshire, with herbage and pannage therein, during the nonage of the King's ward, John Savage, son and heir of the late Sir John Savage. S.B., (an.?) Hen. 8.

Leftwich, Richard; *see* Sir William Brereton. 7 Hen. 8.
Legh, Geoffrey, of Marthall; *see* Peter Foulshurst. 9 Hen. 7.
—— Oliver; *see* Robert Warihull. 16 Hen. 7.

110. —— Roger, gentleman; to have wardship and marriage of William, son and heir of William Shert, with custody of his lands. S. B., 24 May, 8 Hen. 8.

No. 2.—Welsh Records : Warrants, Signed Bills, &c.—*continued.*

163. Legh, John, Esq.; grant in tail male of the lands in Torkington, Cheshire, called "Heppales," and of the lands in Torkington formerly belonging to Ralph Shagh, outlawed. P. S., Hampton Court, 17 May, 35 Hen. 8.

Le Strange, George Stanley, Lord ; *see* Thomas, Earl of Derby. 6 Hen. 7.

—— George, Lord; *see* Sir Thomas Englefield. 5 Hen. 8, and 2 Hen. 8.

145. Letters of Pardon. Warrant for the issue of Letters of Pardon for such of the inhabitants of the county of Chester as have committed any breach of the laws within the said county previous to 1st Jan., 22 Hen. 8, without paying any fine to the King. P. S., Richemount, 4 Jan., 22 Hen. 8.

128. Leversage, William, and Isabella Vernon, widow ; to have wardship and marriage of Robert, son of Ralph Vernon, with custody of his lands. P. S., Esthampsted, 26 Aug., 15 Hen. 8.

36. Lincoln, William, Bishop of, President of the Prince of Wales' Council, John, Bishop of Coventry and Lichfield, his Chancellor, Thomas, Marquis of Dorset, his uncle, Thomas, Earl of Derby, and Sir George Strange, Lord le Strange, Justices of Cheshire, Sir Richard Pole, Chamberlain, Sir Richard Croft, Seneschall, Sir Henry Vernon, Treasurer, Sir William Uvedale, Controller, Robert Frost, Almoner, Thomas Englefield and Thomas Poyntz, Counsellors ; Commission for them to levy money in the counties of Chester and Flint to aid the King in his war with the Scotch. W., Ludlow Castle, 1 Apr. 12 Hen. 7.

55. —— William, Bishop of, President of the Council of Arthur, Prince of Wales, Robert Frost, his Chancellor, Sir Richard Pole, Treasurer, Thomas, Abbot of Basingwork, Sir Thomas Salisbury, John Chaloner, a Justice of Cheshire, William Tatton, a Baron of the Prince's Exchequer, and Ralph Birkhead ; Commission for them to collect from the inhabitants of Cheshire and Flintshire the customary gift or subsidy called "le mise," due to Arthur, Prince of Wales, on his first entrance on his inheritance in those counties. W., Beaudeley, 14 August, 15 Hen. 7.

Litdover, Robert ; *see* Sheriff of Cheshire. 16 Hen. 7.

147. Lloyd, Ranulph, and Robert Tatton ; to have reversion of the office of Clerk or Baron of the Exchequer of the county of Chester, with a wage of 6*d.* a day and other customary fees, now held by Ranulph Brereton by virtue of Patent, 12 May, 21 Hen. 8. S. B., 4 Feb., 23 Hen. 8.

London, Thomas, Bishop of ; *see* Maxfeld Park. 14 Hen. 7.

Lovell, Sir Francis Lord ; *see* Sir Richard Cholmeley. 12 Hen. 8.

66. Lynom, Thomas ; to hold for life the office of Controller of all pleas, fines, recognizances, &c., within Cheshire and Flintshire. W., 8 Oct., 16 Hen. 7.

Macclesfield, Borough of; *see* Hugh Manyfold, 6 Hen. 8 ; Robert de la Hay, 8 Hen. 8. ; Walter Frost, 10 Hen. 7.

—— Hundred of ; *see* William Warde. 10 Hen. 7.

—— Forest of ; *see* Edmund Savage, 23 Hen. 8 ; Hugh Manyfold, 6 Hen. 8.

—— Forest of ; *see* John Sutton, 8 Hen. 8. ; Robert de la Hay, 8 Hen. 8.

25. Mainwaring, Roger; to hold the office of Escheator of Cheshire; and Edmund Bulkeley, the office of Attorney to Arthur, Prince of Wales, in Cheshire. W., Ludlow Castle, 14 July, 10 Hen. 7.

—— Roger ; *see* Sir Reginald Bray. (An. ?) Hen. 7.

—— Jacob, and his wife, Margaret, daughter of Thomas Fitton, of Pownall ; *see* John Pownall. (An.?) Hen. 7.

—— Charles; *see* the same.

86. —— John, a Squire of the King's body ; appointment of, as Bailiff of the lordship of Drakelow and Rudheath, Cheshire. P. S., Windsor, 13 Oct., 3 Hen. 8.

91. —— Ralph, of Middlewich, and Elizabeth his wife ; licence to boil salt, and to sell it and other merchandise in Middlewich. S. B., 10 April, 5 Hen. 8.

122. —— Peter, Priest ; to be Custos of the Lazar House of St. Egidius of Boughton, outside the eastern barriers of Chester, with such fees, &c., as Richard Ardwall and Bartholomew Tatton, Priests, former Keepers, had. S.B., 24 July, 10 Hen. 8.

—— Roger ; *see* William Brereton. (An. ?) Hen. 8.

—— Sir John ; *see* Thomas Sonde. (An. ?) Hen. 8.

Malpas, Church of ; *see* Sir Ranulph Brereton. 14 Hen. 7.

46. Manley, Ellen, late wife of Jacob; to have wardship and marriage of Jacob, son of the late Jacob, with custody of his lands, on payment by instalments of 200*l.* to Arthur, Prince of Wales, for which payment William Stanley, of Hooton, Thomas Pole, of Pole, Sir John Daune, of Utkinton, and —— Aston, of Aston, are to be security. W., Ludlow Castle, 20 Aug., 13 Hen. 7.

—— Jacob ; *see* Ellen Manley.

No. 2.—Welsh Records: Warrants, Signed Bills, &c.—*continued.*

96. Manyfold, Hugh; to have lease for life of the tolls of the fairs held at the Feasts of All Saints and St. Barnabas, in the borough of Macclesfield, and of the pannage of pigs, estrays, and "miner' lapid'," called "cayrage," in the forest of Macclesfield, for a rent of 19*s.* 8*d.*; 14*s.* 4*d.* being for the tolls, pannage, and estrays, and 5*s.* 4*d.* for the "miner' lapid'." S. B., 1 Sept., 6 Hen. 8.
—— Hugh; *see* Robert de la Hay. 8 Hen. 8.
171. —— Hugh; to be Coroner in the hundred of Macclesfield. S. B., (an.?) Hen. 8.
Mara and Mondrem, Forest of; *see* John Caterall. 7 Hen. 7.
—— Forest of; *see* Ralph Birkenhead. 15 Hen. 7.
Marston; *see* William Venables. 6 Hen 8.
Massey, John, of the Hough; *see* Sir Reginald Bray. (An.?) Hen. 7.
—— Ralph; *see* the same.
Masey, Richard, of Grafton; *see* Matthew Tabley. (An.?) Hen. 7.
38. Masterton, William, son of William Masterton; to be paid the sum of 8*l.* 13*s.* 4*d.* by the Escheator of Cheshire, in recompence for some silver and jewels of that value taken to the Prince of Wales' use out of the custody of John Griffith, of Chester, on a false charge of outlawry. W., Bewdeley, 26 May, 12 Hen. 7.
51 Maxfeld, lease of the park of, and a mill therein, to Thomas, Bishop of London, for 8 years, at 15*l.* per annum. W., Westminster, 28 Nov., 14 Hen. 7.
Middlewich; *see* Ralph Mainwaring. 5 Hen. 8.
——; *see* Adam Potter. 9 Hen. 8.
——; *see* George Croxston. 17 Hen. 8.
—— Town of; *see* Thomas Blackbourn. 18 Hen. 8.
Millet, John; *see* Birkenhead, John. 19 Hen. 8.
Minshull, Randolf; *see* Ralph Pole. 5 Hen. 8.
—— Vernon, lands in; *see* John Pownall. (An.?) Hen. 7.
Mise; a gift or subsidy so called; *see* William, Bishop of Lincoln. 15 Hen. 7.
45. Molyneux, Anne, widow, one of the sisters and heirs of Peter Dutton, brother and heir of John, son and heir of Sir Thomas Dutton; Thomas Skrynen and Elizabeth his wife, second sister and heir of Peter; Ralph Vernon and Margaret his wife, 3rd sister and heir of Peter; John Suthworth, son and heir of Isabella, 4th sister and heir of Peter; and Richard Cholmondley, son of Eleanor, 5th sister and heir of Peter; to have livery of the lands, &c., of Peter, John, and Sir Thomas Dutton. W., Ludlow Castle, 21 March, 13 Hen. 7.
—— Edward, Clerk.; *see* Sir Richard Cholmeley. 12 Hen. 8.
Mordaunt, John; *see* Thomas Kebell. 14 Hen. 7.
3. Moreton, Ralph, of Cheshire; to be released from the recognizance whereby he and three others were bound, 28 Apr., 4 Hen. 7., in the sum of 200 marks for the appearance at the Exchequer, Chester, of Charles Holford, who appeared not, on his paying the forfeited money to William Almere, Yeoman of the Crown, by the King's desire. Warrant directed to Sir William Stanley, Chamberlain of Cheshire. 6 Hen. 7.
Morton, John; *see* Hamo de Caryngton. 36 Hen. 6.
17. Moynshil, Ralph; to have, during pleasure, an annuity of 40*s.* W., 1 Apr., 8 Hen. 7.
Nantwich, Hundred of; *see* Thomas Sonde. 7 Hen. 8.
Navarre, King of; *see* Henry VIII. 16 Hen. 8.
Nesse, Manor of; *see* Lawrence Dutton. 12 Hen. 7.
Newbolt, Richard; *see* Peter Griffith. 3 Hen. 8.
Newhall, Manor of, Cheshire; *see* John Lord Fitzwarren. 8 Hen. 7.
37. Newton, Peter, Clerk of Signet of Arthur, Prince of Wales; to have a lease for 21 years of the lordship of Shotwick, at a yearly rent of 24*l.* 3*s.* 4*d.*, lately held on lease by the Earl of Derby. W., Ludlow, 1 Apr., 12 Hen. 7.
53. —— Peter, Secretary and one of the Councillors to Arthur, Prince of Wales; to have wardship and marriage of Peter, son and heir of Thomas Danyell, with custody of his lands. W., Ludlow, 24 Oct., 14 Hen. 7.
54. —— Peter, Secretary to Arthur, Prince of Wales; to be Park-keeper of Shotwick Park. W., Beawdeley, 15 Aug., 15 Hen. 7.
68. —— Peter; to be Keeper of the Park of Shotwick, Cheshire. W., Ludlow, 14 Oct., 17 Hen. 7.
75. —— Peter; to hold the office of Seneschall of the Manor of Frodsham. W., (an.?) Hen. 7.
—— Peter; *see* John Southall. 16 Hen. 8.
—— Peter; *see* Richard Bream. 28 Hen. 8.
Norley; *see* Ralph Beeston. 10 Hen. 8.
Northwich; *see* Jacob Worsley. 7 Hen. 8.

No. 2.—Welsh Records : Warrants, Signed Bills, &c.—*continued.*

Northwich, Hundred of ; *see* James Worsley. 2 Hen. 8.
23. Norton, Sir Sampson; to be Constable of the Castle of Flint, with 20*l.* a year. W., Ludlow Castle, 1 Apr., 10 Hen. 7.
111. —— Sir Sampson, and John Norton, his kinsman ; to hold the office of Constable of the Castle of Flint, with a yearly salary of 20*l.* and the usual profits of the office ; also an annuity of 20 marks during the King's pleasure to Sampson, and a gift of 10*l.* for expenses incurred by him for the King. P. S., 24 May, 8 Hen. 8.
—— John ; *see* preceding entry.
113. —— John, gentleman ; to be Constable of the Castle of Flint, with salary of 20*l.* per annum, and other dues ; as held formerly by Sir Sampson Norton. S. B., 6 April, 8 Hen. 8.
151. —— Abbot and Canons of the Monastery of, to be examined as to offences against the laws. P. S., Greenwich, 30 Jan., 28 Hen. 8.
Okes, Reginald ; *see* Robert Warihull. 16 Hen. 7.
167. "Our Lady," Monastery of, in Chester ; licence to elect a Prioress in the place of the late one, Margery Tailer, deceased. S. B., Westminster, 10 Feb., (an.?) Hen. 8.
Over, Parish of ; *see* Thomas Brereton. (An. ?) Hen. 8.
Parker, Henry ; *see* William Bedill. 7 Hen. 8.
Pateson, William ; *see* Robert Warihull. 16 Hen. 7.
Pavia, Battle of ; *see* Henry VIII. 16 Hen. 8.
Pennand, Edward ; *see* Peter Fowler. (An. ?) Hen. 8.
Pever, Thomas ; *see* Robert Warihull. 16 Hen. 7.
Pikmer, Ranulph ; *see* Robert Warihull. 16 Hen. 7.
Pole, Thomas, of Pole ; *see* Ellen Manley. 13 Hen. 7.
—— Sir Richard ; *see* William, Bishop of Lincoln, 15 Hen. 7 ; Sir Thomas Cokesey, 15 Hen. 7.
57. —— Sir Richard ; to hold, during pleasure, the office of Chamberlain of Cheshire and custody of the Great Seal at an annual salary of 20*l.*, on surrender of Patent, 10 Apr., 10 Hen. 7, granting the same to Sir Reginald Bray. W., Beawdeley, 10 Jan., 15 Hen. 7.
—— Sir Richard ; *see* Sheriff of Cheshire. 16 Hen. 7.
—— Sir Richard ; *see* William, Bishop of Lincoln. 12 Hen. 7.
89. —— Ralph, and Randolf Minshull ; to have jointly a Corrody in the Monastery of Vale Royal, held singly by Ralph Pole heretofore. P. S., 26 Apr. 5 Hen. 8.
114. —— William, and Edward ap John ; to have a joint annuity of 9*l.* 2*s.* 6*d.* S. B., 1 May, 8 Hen. 8.
118. Potter, Adam, of Middlewich ; licence to boil salt, and sell it and other wares in Middlewich ; also to be a free tenant or burgess thereof. S. B., 2 May, 9 Hen. 8.
72. Pownall, John ; asks for licence to alienate the manor of Erdeswik, together with lands in Wrenbury and Minshull Vernon to Ralph Vernon, Esq., Thomas Pull, son of Sir Thomas Pull, Jordan Stafford, Robert Dokenfeld, Thomas Roode junior, and Richard Starky, son of Geoffry Starky, to hold during the life of Thomas Fitton, of Pownall, with remainder to the heirs male of the said Thomas Fitton, and, failing them, to his daughter Margaret and her heirs by her husband, Jacob Mainwaring, son of Charles Mainwaring, of Croxton, and, failing them, to the heir and assigns of the said Margaret. Licence granted on payment of fine of 20 marks, the annual value of the lands not exceeding 22*l.* Charles Mainwaring and Hugh Hurleton, sureties for payment of the fine. (An. ?) Hen. 7.
Pownall ; *see* preceding entry.
Poyntz, Thomas ; *see* William, Bishop of Lincoln. 12 Hen. 7.
159. Pulford, Thomas ; to have annuity of 4*l.* for life, which John Cunne, deceased, had. P. S., Westminster, 26 June, 30 Hen. 8.
Pull, Thomas ; *see* John Pownall. (An. ?) Hen. 7.
—— Sir Thomas ; *see* the same.
29. Raynford, Henry, Clerk ; presentation to the fourth prebend of the Holy Cross in the College Church of St. John, Chester, void by the death of John Atkins, and in the gift of Arthur, Prince of Wales, by reason of the see of Chester being vacant. W., Beaudeley, 29 July, 11 Hen. 7.
Raynford, Henry ; *see* Sir Ranulph Brereton. 14 Hen. 7.
2. Repingdon, Priory and Church of the Holy Trinity at ; Petition to elect a Prior *vice* Thomas Sutton, resigned. Repingdon, 8 July, 1 Hen. 7.
Rixton, Elizabeth ; *see* Virgin, Convent of the Blessed, Chester. 6 Hen. 7.

No. 2.—Welsh Records : Warrants, Signed Bills, &c.—*continued.*

76. Rodon, John, one of the King's Serjeants-at-Arms ; to be Escheator of Flintshire and Collector of Inglefield. P. S., 23 April, Greenwich, 2 Hen. 8.
Roode, Thomas ; *see* John Pownall. (An.?) Hen. 7.
26. Royden, John, one of the King's Serjeants-at-Arms ; to be Escheator of Flintshire and Collector of the old rents in Englefield. W., Ludlow Castle, 8 Jan., 11 Hen. 7.
Rutland, Castle of, Flintshire ; *see* Peter Griffith. 3 Hen. 8.
Rudheath ; *see* Draklow.
—— *see* Laurence Savage. 6 Hen. 7.
Runcorn, John, of Northwich ; *see* Peter Foulshurst. 6 Hen. 7.
Sadler, Robert ; *see* Ralph Egerton. 16 Hen. 7.
Saint John, Church of, Chester ; *see* Henry Raynford. 11 Hen. 7.
20. Saint Werburgh, Prior and Convent of the Monastery of, Cheshire ; licence to elect an Abbot *vice* Simon Ripley, deceased. W., 7 Sept., 9 Hen. 7.
94. —— Abbot and Convent of ; to have licence to impark 1,000 acres of their domains in Huntingdon, Cheyvelegh, and Saulghton in Cheshire, with free warren in the same. S. B., 15 Sept., 6 Hen. 8.
153. —— Monastery of ; licence to elect an Abbot in the place of John Birchinsha, resigned. P. S., Westminster, 12 Feb., 29 Hen. 8.
154. —— Monastery of, diocese of Coventry and Lichfield ; assent to the election of Thomas Clarke, a monk of the Monastery, to be Abbot of the same. P. S., Palace of Westminster, 11 March, 29 Hen. 8.
155. —— Monastery of ; warrant for restitution of its temporalities, on the election of Thomas Clerc as Abbot *vice* the late Abbot, resigned, the said Thomas having first done homage and fealty, and compounded with the King for the first fruits. P. S., Palace of Westminster, 13 March, 29 Hen. 8.
Salisbury, Sir Thomas ; *see* William, Bishop of Lincoln. 15 Hen. 7.
Saulghton ; *see* Abbot of Saint Werburgh. 6 Hen. 8.
Savage, John ; *see* Hamo de Carynton. 36 Hen. 6.
5. —— Laurence, son of Sir John, senior ; to have a yearly rent of seven marks, part of one hundred shillings, coming from certain lands of the Convent of the Blessed Mary de Dieulencres, called "The Approvement of Rudheath." S. B., 17 Apr., 6 Hen. 7.
10. —— Sir John, the elder ; to be released from prison, whither he had been committed owing to the nonappearance in Court of his son Richard, who was supposed to have murdered Thomas Starkey, of Stratton, gentleman ; Sir John Savage, the younger, being surety for Richard's appearance. W., Shene, 4 June, 7 Hen. 7.
—— Sir John, the younger ; *see* preceding entry.
—— Richard ; *see* the same.
28. —— John, Esq. ; livery of lands to, as son and heir of Sir John Savage, junior, son of Sir John Savage, senior, and as husband of Anne, sister and heir of William Bostock, Esq. W., Ludlow Castle, 10 Apr., 11 Hen. 7.
—— Sir John, senior ; *see* preceding entry.
—— Sir John, junior ; *see* the same.
31. —— John, Esq., and Anne, his wife, sister and heir of William Bostock, Esq., daughter and heir of Ralph Bostock, Esq. ; to have livery of the lands, &c., of William and Ralph Bostock. W., Westminster, 24 Feb., 12 Hen. 7.
33. —— John, Esq., son of John, son of Sir John ; livery to, of the lands of Sir John Savage. W., Westminster, 24 Feb., 12 Hen. 7.
146. —— Edmund, and Richard Savage ; to hold the office of Governor or Conductor of all tenants and servants in the Forest of Macclesfield, with an annuity of 12*l.* S. B., 6 May, 23 Hen. 8.
—— Sir John, and John his son and heir ; *see* Robert Laurence. (An.?) Hen. 8.
30. Scotland, People of ; Arthur, Prince of Wales, commands the King's Proclamation to be published in Cheshire and Flint for all the Scotch (not being denizens) within his realm to quit it by next Candlemas, on account of a raid which the Scotch King had made into England, in violation of a seven years' truce agreed to about four years ago between the two Kings. W., Ludlow Castle, 12 Dec., 12 Hen. 7.
Shagh, Ralph ; *see* Legh, John. 35 Hen. 8.
Sherborne, Robert ; *see* Thomas, Earl of Derby. 6 Hen. 7.
Shert, William, father and son ; *see* Roger Legh. 8 Hen. 8.
Shotwik, Park of ; *see* Peter Newton, 15 Hen. 7 ; Peter Newton, 17 Hen. 7 ; John Southall, 16 Hen. 8 ; Richard Bream, 28 Hen. 8. Lordship of ; *see* Peter Newton, 12 Hen. 7.

No. 2.—Welsh Records : Warrants, Signed Bills, &c.—*continued.*

135. Sidney, Francis, one of the King's Equerries ; to have reversion of the office of Constable of Chester Castle, granted by Patent 1 Apr., 2 Hen. 8, to Ralph Egerton. P. S., Greenwich, 20 June, 17 Hen. 8.

Skrynen, Thomas, and Elizabeth his wife ; *see* Anne Molyneux. 13 Hen. 7.

140. Snelson, Edward, and Ralph Bekett, of Middlewich ; to be made Burgesses of the said town, with all liberties and privileges thereto belonging, according to the effect and tenure of the Patent formerly granted to Ralph Cross, Charles Bulkeley, Richard Davenport, and Piers Yate. W., 21 May, 19 Hen. 8.

Sneyde, Richard ; *see* Urian Brereton. 35 Hen. 8.

78. Sonde, Thomas, one of the Yeomen of the King's Guard; to be Bailiff of Drakelowe and Rudheath, *vice* Henry Wright of the King's Guard, deceased. S. B., Chester, 1 Jan., 2 Hen. 8.

100. —— Thomas, one of the King's Guard ; reappointment as Bailiff of the hundred of Nantwich, in like manner as Hugh Grymesdyche formerly was, on surrender of Patent, 1 Oct., 3 Hen. 8, granting the same office to the said Thomas, with pardon for all debts and arrears. S. B., 1 July, 7 Hen. 8.

—— Thomas ; *see* Roger Brereton. 17 Hen. 8.

175. —— Thomas ; to be Bailiff of Drakelowe and Rudheath *vice* Sir John Mainwaring, deceased. S. B., (an. ?) Hen. 8.

133. Southall, John ; to be Keeper of the Park of Shotwick, Cheshire, *vice* Peter Newton, deceased, with herbage and pannage. S. B., 23 Aug., 16 Hen. 8.

Southwell, John ; *see* Richard Bream. 28 Hen. 8.

Spencer, Thomas ; *see* Robert Warihull. 16 Hen. 7.

—— Ralph ; *see* the same.

Sproston ; *see* William Venables. 6 Hen. 8.

Stafford, John ; *see* John Pownall. (An. ?) Hen. 7.

Stanley, Sir William ; *see* Ralph Moreton. 6 Hen. 7.

—— Sir William ; *see* Thomas, Earl of Derby. 6 Hen. 7.

16. —— Thomas, Esq. ; to hold the offices of Sheriff of Cheshire, and of Sheriff and "Raglorie" of Flintshire. W., 20 Jan., 8 Hen. 7.

—— William, of Hooton ; *see* Ellen Manley. 13 Hen. 7.

Starkey, Thomas, of Stratton ; *see* Sir John Savage, the elder. 7 Hen. 7.

—— Thomas ; *see* Sheriff of Cheshire. 16 Hen. 7.

—— Richard ; *see* John Pownall. (An. ?) Hen. 7.

—— Geoffrey ; *see* the same.

Strange, Sir George, Lord le Strange ; *see* William, Bishop of Lincoln. 12 Hen. 7.

Suthworth, John ; *see* Anne Molyneux. 13 Hen. 7.

Sutton, Thomas ; *see* Repingdon. 1 Hen. 7.

6. —— Richard ; to be Serjeant-at-Law to the Prince of Wales within the county of Chester. W., Westminster, 1 Feb., 6 Hen. 7.

115. —— John, of Sutton, and his heirs ; to have licence to impark lands in Sutton, Cheshire, within the Forest of Macclesfield, extending in breadth from the town of Gowseworth to a mill called Macclesfield Mylne, and in length from Macclesfield Mylne to Bowres Howse and Langley, and from Langley to Whythynsha, and from Whythynsha to Gowseworth, through a pasture called Le Mynne, with free warren and licence to take game therein ; also to be Surveyors, Equitators, and Controllers of all the King's Officers of the Forest of Macclesfield, at an annual salary of 3*l.* 13*s.* 4*d.*, being what was yearly due from them to the King for the aforesaid lands ; with confirmation to them of all their lands in Sutton and Anderton, to be held of the king by fidelity only ; with pasturage in Macclesfield Forest, and exemption from serving on juries, &c. S. B., 21 June, 8 Hen. 8.

117. —— Richard, Esq. ; to have wardship and marriage of Edward, son and heir of John Worth, with custody of his lands. S. B., 2 April, 9 Hen. 8.

Swetenham, Henry ; *see* Robert Warihull. 16 Hen. 7.

—— George ; *see* the same.

73. Tabley, Matthew, of Overtabley, Cheshire, gentleman. Pardon for all offences on payment of 10 marks. S. B., (an. ?) Hen. 7. Richard Massy, of Grafton, John Torkynton, and John, son of Ralph Green, of Goosetree, sureties for the payment.

Tatton, William ; *see* William, Bishop of Lincoln. 15 Hen. 7.

—— Bartholomew ; *see* Peter Mainwaring. 10 Hen. 8.

—— John ; *see* Ranuph Brereton. 21 Hen. 8.

—— Robert ; *see* Ranulph Lloyd. 23 Hen. 8.

Troutbek, Sir William ; *see* John Chalener. (An. ?) Hen. 8.

No. 2.—Welsh Records : Warrants, Signed Bills, &c.—*continued.*

121. Tiler, Sir William ; to have wardship and marriage of John, son and heir of Richard Daune, *alias* Done, *alias* Doune, with custody of his lands. P. S. Hanworth, 9 Aug., 9 Hen. 8.
Tilston, Richard, of Huxley ; *see* Peter Foulshurst. 9 Hen. 7.
Torkynton, John ; *see* Matthew Tabley. (An. ?) Hen. 7.
—— ; *see* John Legh. 35 Hen. 8.
Tuderington ; *see* Roger Downes. 10 Hen. 8.
Tunstall, Sir Richard ; *see* Hamo de Caryngton. 36 Hen. 6.
Uvedale, Sir William ; *see* William, Bishop of Lincoln. 12 Hen. 7.
14. Venables, William ; warrant to the Chamberlain of Cheshire to stop by Writ of Supersedeas the Inquisition on the death of the said William. W., Shene, 17 Oct., 8 Hen. 7.
39. —— Thomas, son and heir of William ; to have licence to enter upon his late father's lands. W., Beaudley, 23 May, 12 Hen. 7.
—— William ; *see* preceding entry.
—— Henry ; *see* Robert Warihull. 16 Hen. 7.
—— William ; *see* Richard Cotton. 5 Hen. 8.
95. —— William, of Kinderton, son and heir of the late Thomas Venables, who was slain in the Scotch wars, 5 Hen. 8, and who died seised in his demesne as of fee tail of the manors of Kinderton, Sproston, Bradwall, Witton, Marston, Eccleston, and Curtshobne, in Cheshire; prays for pardon of 46*l.* 8*s.* 6*d.*, 25*l.* being due to the King for a release, and 57*l.* 17*s.* for delay in suing for livery of his lands. S. B., (6 ?) Hen. 8.
—— Thomas ; *see* preceding entry.
Vale Royal, Abbot and Convent of ; *see* Robert Warihull. 16 Hen. 7.
—— Monastery of ; *see* Ralph Pole. 5 Hen. 8,
Vernon, Sir Henry ; *see* William, Bishop of Lincoln. 12 Hen. 7.
—— Ralph, and Margaret his wife ; *see* Anne Molyneux. 13 Hen. 7.
—— Henry ; *see* Robert Warihull. 16 Hen. 7.
—— Ralph ; *see* John Pownall. (An. ?) Hen. 7.
—— Isabella ; *see* William Leversage. 15 Hen. 8.
—— Ralph ; *see* the same.
—— Robert ; *see* the same.
4. Virgin, Convent of the Blessed, Chester ; licence to elect a Prioress in the place of Elizabeth Rixton, deceased. W., 22 Nov., 6 Hen. 7.
Wales, Prince of ; *see* Arthur Prince of Wales.
Waley, Peter ; *see* Robert Warihull. 16 Hen. 7.
Walton, Roger ; *see* Ralph Beeston. 10 Hen. 8.
130. Warburton, Thomas, gentleman ; to be Sheriff of the county of Chester in the place of Sir John Warburton, deceased. S. B., Chester, 8 April, 15 Hen. 8.
Warburton, Sir John ; *see* preceding entry.
24. Warde, William ; to have an annuity of five marks for life, on surrender of Patent, 1 Hen. 7, granting him all fines, forfeitures, issues, and profits of the hundred of Macclesfield for life. W., Ludlow Castle, 19 July, 10 Hen. 7.
63. Warihull, Robert, William Wever, Thomas Boteras, Thomas Pever, Reginald Okes, William Pateson, Abbot and Convent of Vale Royal, Henry Venables, Henry Swetenham, Oliver Legh, Robert Blackborne, John Fovell, Humphrey Blackborne, Thomas Wright, George Swetenham, Thomas Spencer, Robert Eyre, Ranulph Pikmer, Peter Waley, Charles Bostock, Henry Vernon, and Ralph Spencer ; discharge from the payment of sums of money named in a bill annexed to the warrant, and charged to their account at the Exchequer of Chester, but found to be not justly leviable. W., Beawdeley, 10 March, 16 Hen. 7.
Weston, Manor of ; *see* Jane Dutton. 12 Hen. 7.
Westwood, Richard ; *see* William Bedyll. 7 Hen. 8.
Wetenhall, John ; *see* Ralph Egerton. 16 Hen. 7.
—— Roger ; *see* the same.
Wever, William ; *see* Robert Warihull. 16 Hen. 7.
Whitingham, Robert ; *see* Hamo de Caryngton. 36 Hen. 6.
Whitemore, John, and Cecilia his wife ; *see* Ralph Birkenhead. 12 Hen. 7.
—— William, and Marion his wife ; *see* the same.
Wiche, Edward, of Northwich ; *see* Peter Foulshurst. 9 Hen. 7.
12. Wicksted, Thomas ; to hold the office of Vendor of the goods and chattels of felons, fugitives, intestates, &c., in the county of Flint. W., 4 Apr., 7 Hen. 7.
Wilbraham, William ; *see* Sir William Brereton. 7 Hen. 8.
Williamson, Thomas, of Cholley, *alias* of Hatton ; *see* Peter Foulshurst. 9 Hen. 7.
—— Richard ; *see* Sir Richard Cholmeley. 12 Hen. 8.

No. 2.—Welsh Records : Warrants, Signed Bills, &c.—*continued.*

Willott, Richard ; *see* Roger Downes. 10 Hen. 8.
Wirall, Hundred of; David Fraunceys. 9 Hen. 8.
Withinshaw ; *see* John Sutton. 8 Hen. 8.
Witton ; *see* William Venables. 6 Hen. 8.
Wolton, Sir Thomas ; *see* William, Bishop of Chester. 8 Hen. 7.
88. Wode, Robert ; to hold the office of Bailiff of the hundred of Eddesbury, lately held by John Coke. S. B., 1 July, 4 Hen. 8.
102. Wood, Robert, one of the Yeomen of the King's Guard; to have an annuity of 20 marks for life. S. B., 24 June, 7 Hen. 8.
126. —— Robert, Yeoman Usher of the King's Chamber ; on surrender of Patent, 1 July, 4 Hen. 8, granting him the office of Bailiff of the hundred of Eddesbury, lately held by John Coke, is reappointed to the same office, with pardon of all past debts and arrears. S. B., 12 May, 12 Hen. 8.
148. Wode, Robert ; to have an annuity of 6*l.* as a recompence on surrender of Patent, 12 May, 12 Hen. 8, granting him the office of Bailiff of the hundred of Eddesbury. S. B., 28 May, 25 Hen. 8.
81. Worsley, James, Page of the King's wardrobe, to hold the office of Bailiff of the hundred of Northwich, formerly held by Roger Brereton. P. S., Greenwich, 23 March, 2 Hen. 8.
99. —— James, Page of the King's wardrobe ; on surrender of Patent, 10 April, 2 Hen. 8, appointing him Bailiff of the hundred of Northwich, Cheshire, is reappointed to the same office, with pardon of past debts and arrears. S. B., 3 Oct., 7 Hen. 8.
132. —— Ralph, Page of the King's robes; to have an annuity of 40*s.* for life, in the place of David Frances, deceased. S. B., 16 Hen. 8.
Worth, Edward ; *see* Richard Sutton. 9 Hen. 8.
—— John ; *see* Richard Sutton. 9 Hen. 8.
—— Celicia, widow, and Leonard, younger son of the late John ; *see* Roger Downes. 10 Hen. 8.
Wrenbury, Lands in ; *see* John Pownall. (An. ?) Hen. 7.
34. Wright, Henry, Yeoman of the Prince of Wales' Chamber ; to be Bailiff of Rudheath and Draklow. W., Chester, 19 Nov., 12 Hen. 7.
—— Thomas ; *see* Robert Warihull, 16 Hen. 7.
—— Henry ; *see* Thomas Sonde, 2 Hen. 8.
27 Wynnyngton, Richard ; livery of lands to, as son and heir of Richard Wynnyngton, deceased. W., 10 Apr., 11 Hen. 7.
Yate, Piers ; *see* Edward Snelson. 19 Hen. 8.

Prepared and examined by
(Signed) E. H. Rhodes.

No. 3.—Welsh Records.

Calendar of all Writs of General Livery, Ouster-le-Main, &c.; Elizabeth, James I., and Charles I.: removed from Chester to the Public Record Office in 1854.

County of Chester.

The following abbreviations are used :—G. L., Writ of General Livery ; O. M., Writ of Ouster-le-Main ; Inq., Inquisition.

Brackets enclosing the abbreviation Inq. and a date, *e.g.*, [Inq., 3 Dec., 5 Edw. 6,] are prefixed to that portion of an entry which contains information derived from an Inquisition taken at that date, and cited in the document of which that entry is an abstract.

Acton, Lands in; *see* George Rutter.

Aggdon; *see* Lady Eleanor Brereton.

Anderton, William; *see* William Malbon.

Assheley, George, Esq.; *see* Lady Eleanor Brereton; and George Brereton.

—— Thomasina, daughter of George, and wife of Richard Brereton ; *see* Lady Eleanor Brereton; and George Brereton.

—— Hamo; *see* George Brereton.

—— John; *see* the same.

—— Lands in; *see* the same.

Aston; *see* Robert Whytney.

Basingwark, Monastery of; *see* Matthew Ellis.

1. Bawdon, Urian ; livery of lands, as heir of Henry Bawdon, gentleman, who [Inq., 24 June, 38 Hen. 8,] died seised of three messuages in Bowden, Cheshire, holden of William Bothe, Esq., and of other lands and tenements in Bowdon, Dunham, Hale, and Woodhouse. G. L., Feb., 1 Eliz.

—— Henry; *see* preceding entry.

Beycheton; *see* Ranulph Davenport.

22. Bickerton, Roger; livery of lands as brother and heir of Hugh Bickerton, gentleman, who [Inq., 10 Jan., 35 Eliz.,] died seised of lands in Newhall, Townley, Tylston, Wordyhull, Bridgemery, Horton, Olaveley, and Bunbury, Cheshire; the said Hugh and George Bickerton were also jointly seised of lands in Townley, Egerton, and Bickerton, Wordhull, Blackenhall, Bridgemore, and Tylston, Cheshire, which lands they, by deed dated 18 July, 34 Eliz., assured to Margerye, wife of the said George, for her life, except three pastures called Great Calverhey, Little Calverhey, and the Narr Mycklefeilde, which were for the use of the said Margerye during her life, and after her decease to go to the said George and his heirs. The said Margerye having survived the said George, still holds these lands. G. L., 14 Nov., 36 Eliz.

—— Hugh; *see* preceding entry.

—— George; *see* the same.

—— Margerye; *see* the same.

—— Lands in ; *see* the same.

Birche, Lands in; *see* Thomas Hulse.

Blackenhall, Lands in; *see* Roger Bickerton.

Boothe, William, Esq.; *see* George Brereton; and John Carington.

Bothe, William; *see* Urian Bawdon.

Bowden; *see* Urian Bawdon.

23. Boydell, John; livery of lands as son and heir of Thomas Boydell, gentleman, who [Inq., Oct. 19, Eliz.,] died seised of lands in Pulcroft and Worlaston. O. M., 30 Nov., 36 Eliz.

—— Thomas; *see* preceding entry.

Bradley; *see* Lady Eleanor Brereton; and George Rutter.

7. Brereton, Lady Eleanor, late wife of Sir William Brereton, of Brereton, claims the manor of Ley and Wymbaldesley as having by deed, dated 6 June, 3 & 4 Phil. & Mary, been granted her for life by her son, Richard Brereton, Esq., who [Inq., 28 Apr., 1 Eliz.,] died 20 Aug., 2 Eliz., seised in tail male of lands in Malpas, Bradley, near Malpas, Aggdon, Egge, and Oldcastle, Chesbire, parcell of the barony of Malpas ; also died seised in tail, for his heirs by his wife Thomasina, daughter and heir of George Assheley, Esq., of the manor of Ley and Wymbaldesley, leaving by his wife Thomasina a son and heir, George Brereton, aged 11. Writ, traverse, and replication, 3 Eliz.

No. 3.—Welsh Records: General Livery, Ouster-le-Main, &c.—*continued.*

Brereton, Sir William; *see* preceding entry.
—— Richard, Esq.; *see* the same.
—— George; *see* the same.
13. —— George, Esq., son and heir of Thomasina, daughter and heir of George Assheley, son and heir of Hamo, son and heir of John Assheley; licence to enter upon lands as heir of the said George Assheley, who, at his death, held the manor of, and lands in, Assheley, with the reversion of other lands in Assheley held of William Boothe, Esq., as of his manor of Dunham Massy, and the reversion of a yearly rent of 22*s.* 10*d.* from the lands of Thomas Devias, Richard Hesketh, and others. 6 May, 11 Eliz.
18. —— Richard; licence to enter upon lands as son and heir of John Brereton, Esq. 6 May, 18 Eliz.
—— John, Esq.; *see* Richard Brereton.
Bridgemery, Lands in; *see* Roger Bickerton.
Bridgemore, Lands in; *see* Roger Bickerton.
19. Brooke, Thomas, Esq.; licence to enter upon lands as son and heir of Richard Brooke, Esq. 18 Eliz.
—— Richard, Esq.; *see* preceding entry.
Budworth, Great, Lands in; *see* William Malbon.
8. Bunbury, Thomas, gentleman; licence to enter upon lands, &c., as son and heir of Henry Bunbury, Esq. 22 Feb., 5 Eliz.
—— Henry; *see* preceding entry.
26. —— Henry, Esq.; licence to enter upon lands as son and heir of Thomas Bunbury, Esq. 18 May, 44 Eliz.
—— Thomas, Esq.; *see* preceding entry.
—— Lands in; *see* Roger Bickerton.
29. Burges, Catherine; livery of lands as one of the daughters and coheirs of Robert Burges, of Peevor, Cheshire, gentleman, who [Inq., 20 Aug., 17 Jas. 1,] died seised of lands in Withington, Ollerton, Over Peever, Over Knuttesford, Knuttesford Boothes, Nether Knuttesford, and the Crosse Town of Knuttesford, Cheshire. G. L., 16 June, 22 Jas. 1.
—— Robert; *see* preceding entry.
Calveley, Manor of; *see* Arthur Davenport.
Calvérhey, Great and Little, pastures so called; *see* Roger Bickerton.
16. Carington, John, Esq.; livery of lands as son and heir of John Carington, Esq., who [Inq., 19 Dec., 1 Mary,] died seised of lands in Carington holden of William Booth, Esq., as of his manor of Dunham Massey. O. M., 4 May, 15 Eliz.
—— John; *see* preceding entry.
—— Lands in; *see* the same.
Chester, City of; *see* Matthew Elles.
Church Coppenhall, Manor of; *see* Thomas Hulse.
9. Corbett, Robert, Esq.; licence to enter upon lands, &c., as son and heir of Robert Corbett, Esq. 28 May, 5 Eliz.
—— Robert; *see* preceding entry; and Thomas Hulse.
—— Robert, Esq.; *see* Robert Whitney; and Thomas Hulse.
Cuddington, Lands in; *see* George Rutter.
30. Daniel, John; livery of lands as son and heir of John Daniel, Esq., who [Inq., 30 Apr., 8 Jas. 1,] died seised of lands in Derresbury and in Newton, Hatton, Over Walton, all near Derresbury, and in Dutton, Eccleston, Raghall, and Lathbrock, Cheshire and Lancashire. G. L., 16 Nov., 11 Chas. 1.
—— John, Esq.; *see* preceding entry.
14. Davenport, Randulph, Esq.; livery of lands as son and heir of John Davenport, Esq., who [Inq., April, 3 & 4 Phil. & Mary,] died seised of the capital messuage Henbury Pexhull, with lands thereto belonging, holden of the manor of Halton, and of lands in Beycheton holden of the manor of Newhall, and of other lands in Cheshire. O. M., 23 April, 12 Eliz.
—— John; *see* preceding entry.
28. —— Arthur; livery of lands as son and heir of Hugh Davenport, Esq., who [Inq., 20 Nov., 1 Jas. 1,] died seised of the manor of Calveley, and the moiety of the manor and advowson of Hessewall, alias Hesselwall, and of other lands in Cheshire. G. L., 22 April, 11 Jas. 1.
—— Hugh, Esq.; *see* preceding entry.
Derresbury, Lands in; *see* John Daniel.
Devias, Thomas; *see* George Brereton.
2. Dutton, John, Esq., cousin and heir of Sir Peter; licence to enter upon lands, &c. 29 May, 1 Eliz.
—— Sir Peter; *see* preceding entry.
—— Lands in; *see* John Daniel.

No. 3.—Welsh Records: General Livery, Ouster-le-Main, &c.—*continued.*

Dunham; *see* Urian Bawdon.
Dunham Massy, Manor of; *see* George Brereton; and John Carington.
Eccleston, Lands in; *see* Matthew Ellis; and John Daniel.
Egerton, Lands in; *see* Roger Bickerton.
Egge; *see* Lady Eleanor Brereton.

12. Ellis, Matthew; livery of lands as son and heir of Matthew Ellis, who [Inq., Feb., 1 Edw. 6,] died seised of land and houses in the city of Chester, and of lands in Overley. G. L., 8 Nov., 7 Eliz.

—— Matthew; *see* preceding entry.

21. —— Matthew; livery of lands as son and heir of Matthew Ellis, who [Inq., 20 April, 17 Eliz.,] died seised of lands in Overleighe, near Handbridge, Cheshire, lately belonging to the Monastery of Basingwark, and of lands in Handbridge, Olaverton, and Eccleston, Cheshire. G. L., 12 Nov., 32 Eliz.

—— Matthew; *see* preceding entry.

3. Eyton, Richard; livery of lands as son and heir of Robert Eyton, gentleman, who [Inq., 21 Aug., 4 & 5 Phil. & Mary,] died seised of lands in . . . . . Cheshire. G. L., May, 1 Eliz.

—— Robert; *see* preceding entry.

Froddesham, Lands in; *see* George Rutter.

10. Fytton, Bartelmewe; livery of lands as son and heir of Robert Fytton, who [Inq., 10 May, 6 Eliz.,] died seised of lands in Sutton, within the Forest of Macclesfield, holden of the Queen by the service of finding a huntsman to follow her hounds in the said Forest and the yearly rent of "iiii. payre of copies of hear," and of other lands in Cheshire. G. L., 31 Oct., 6 Eliz.

—— Robert; *see* preceding entry.

Hale; *see* Urian Bawdon.
Halton; *see* Thomas Tochat; Ranulph Davenport; William Millington; and John Daniel.
Handbridge; *see* Matthew Ellis.
Hatherton, alias Hadderton, Manor of; *see* Thomas Hulse.
Henbury, Pexhull; *see* Ranulph Davenport.
Hesketh, Richard; *see* George Brereton.
Hesselwall, alias Hesselwall, Manor and advowson of; *see* Arthur Davenport.
Heswell, Lands in; *see* George Rutter.
Horton, Lands in; *see* Roger Bickerton.

15. Hulse, Thomas; livery of lands as cousin and heir of Robert Corbett, Esq., who [Inq., 26 June, 12 Eliz.,] was seised of the manors of Hatherton, alias Hadderton, Walgherton, and Church Coppenhall, with lands in Hatherton (whereof part were purchased by Robert, father of the said Robert Corbett, and late in the tenure of William Trickett), Walgherton, Church Coppenhall, Shovington, Birche, and elsewhere in Cheshire, all which lands the said Robert Corbett by several deeds did assure to several uses, with last remainder of some of the lands to his right heirs, and of other of the lands to Thomas Vernon and his heirs. G. L., 14 Nov., 14 Eliz.

Kingesley, Lands in; *see* George Rutter.
Kingesy, Lands in; *see* the same.
Knuttesford, Lands in; *see* Catherine Burges.
Lathbrock, Lands in; *see* John Daniel.
Ley and Wymbaldesley, Manor of; *see* Lady Eleanor Brereton.

31. Malbon, William, gentleman; livery of lands as son and heir of William Malbon, gentleman, who [Inq., 14 July, 7 Chas. 1,] died seised of lands in Great Budworth, Cheshire, partly purchased of William Anderton. G. L., 28 Jan., 11 Chas. 1.

—— William; *see* preceding entry.

Malpas; *see* Lady Eleanor Brereton.

25. Millington, William, gentleman; livery of lands as son and heir of John Millington, of Millington, Cheshire, gentleman, who [Inq., 23 Sept., 34 Eliz.,] died seised of the manor of Millington holden of the Queen as of her honor of Halton. O. M., 6 Feb., 40 Eliz.

—— John; *see* preceding entry.

—— Manor of; *see* the same.

27. Mynshull, Edward; livery of lands as son and heir of Geffrye Mynshull, gentleman, who [Inq., 26 Dec., 1 Jas. 1,] died seised of lands in Nantwich, Cheshire. G. L., 28 Nov., 2 Jas. 1.

—— Geffrye; *see* preceding entry.

Nantwich, Lands in; *see* Edward Mynshull.
Narr Mycklefeilde, Pasture so called; *see* Roger Bickerton.
Netherwhitley; *see* Thomas Tochat.

No. 3.—Welsh Records : General Livery, Ouster-le-Main, &c.—*continued.*

Newhall ; *see* Ranulph Davenport ; and Roger Bickerton.
Newton, Lands in ; *see* George Rutter ; *see* John Daniel.
Norley, Lands in ; *see* George Rutter.
Olaveley, Lands in ; *see* Roger Bickerton.
Olaverton, Lands in ; *see* Matthew Ellis.
Oldcastle ; *see* Lady Eleanor Brereton.
Ollerton, Lands in ; *see* Catherine Burges.
Overley ; *see* Matthew Ellis.
Over Peever, Lands in ; *see* Catherine Burges.
Overwalton, Lands in ; *see* John Daniel.
Peevor ; *see* Catherine Burges.
Pulcroft, Lands in ; *see* John Boydell.
Raghall, Lands in ; *see* John Daniel.

20. Ridley, Anna and Elisabeth, daughters of Thomas Ridley, brother and . . . . ; livery of lands as two of the three cousins and co-heirs of John Ridley, who [Inq., 20 Jan., 3 Eliz.,] died seised of lands in Torperley and Tearton, Cheshire. O. M., 18 Nov., 22 Eliz.

—— Elisabeth ; *see* preceding entry.
—— Thomas ; *see* the same.
—— John ; *see* the same.

24. Rutter, George ; livery of lands as son and heir of Thomas Rutter, of Kingesley, Cheshire, gentleman, who [Inq., 1 Sept., 36 Eliz.,] died seised of the manor of Kingesley, with land, in Kingesy, Norley, Newton, and Cuddington, also of lands in Acton near Weverham, Froddesham, Bradley, and Heswell, Cheshire. G. L., 31 May, 37 Eliz.

—— Thomas ; *see* preceding entry.

Shovington ; *see* Thomas Hulse.
Sutton ; *see* Bartelmewe Fytton.
Tearton, Lands in ; *see* Anna Ridley.
Tylston, Lands in ; *see* Roger Bickerton.

5. Tochat, Thomas ; livery of lands as son and heir of John Tochat, who [Inq., 4 Oct., 5 Edw. 6,] died seised of the site of the manor of Netherwhitley, called the Hall of Netherwhitley, and of other lands in Cheshire, held of the late King as of his Barony of Halton, parcel of his Duchy of Lancaster. O.M., May, 3 Eliz.

—— John ; *see* preceding entry.

Torperley, Lands in ; *see* Anna Ridley.
Townley, Lands in ; *see* Roger Bickerton.

17. Trafford, Thomas, gentleman ; licence to enter upon lands as son and heir of Thomas Trafford. June, 16 Eliz.

—— Thomas ; *see* preceding entry.

Trickett, William ; *see* Thomas Hulse.

4. Venables, Sir Thomas, son and heir of Sir William ; licence to enter upon lands, &c. 10 Jan., 3 Eliz.

—— Sir William ; *see* preceding entry.

Vernon, Thomas ; *see* Thomas Hulse.
Walgherton, Manor of ; *see* Thomas Hulse.

6. Warburton, John ; licence to enter upon lands, &c., as son and heir of Lady Elizabeth Warburton. 26 Nov., 3 Eliz.

—— Lady Elizabeth ; *see* preceding entry.

11. Whytney, Robert ; livery of lands as son and heir of Robert Whytney, who [Inq., 3 Dec., 5 Edw. 6,] died seised of lands in Co . . . and Aston next Bromehall, holden of the Queen, and of other lands in Cheshire, holden in soccage of Robert Corbett, Esq. G. L., 13 Feb., 7 Eliz.

—— Robert ; *see* preceding entry.

Wymbaldesley, Manor of Ley and ; *see* Lady Eleanor Brereton.
Withington, Lands in ; *see* Catherine Burges.
Woodhouse ; *see* Urian Bawdon.
Wordhull, Wordyhull, Lands in ; *see* Roger Bickerton.
Worlaston, Lands in ; *see* John Boydell.

Prepared and examined by
(Signed) E. H. RHODES

No. 4.—Welsh Records.

Calendar of Deeds, Inquisitions, and Writs of Dower, enrolled on the Plea Rolls of the County of Chester.—Henry 3 and Edward 1.

These "Placita" or "Plea Rolls" contain enrolments, not only of all actions at law brought to a verdict, but, in ancient times, of the preliminary steps in actions that never proceeded even so far as an issue; also Pleas of the Crown, except in modern times, when few have been recorded; enrolments of the patents of Judges, King's attorneys, and prothonotaries; deputations from the Judges; deeds and other documents ordered to be enrolled; and all fines and recoveries. The most ancient Records of this class are very miscellaneous in their contents, and abound with curious historical matter; they are also made up for unequal periods, some rolls for one year, some for two or part of two, some for several years together (as one very large roll of 27–32 Edward III.); but for the last three centuries they have been made up in Sessional Rolls. (Mr. Black's Report on the Records of Wales and Chester: Appendix to First Report of Deputy Keeper of the Public Records, p. 80.)

The date in the margin is that of the entry as far as can be inferred from the heading of the membrane on which it appears; the date in italics at the end of each entry is the reference to the Roll.

40 Hen. 3. Dutton, Agnes, who was the wife of G. de, against Geoffrey, son of Geoffrey . . . . . de Masey. Dower of lands, &c., in Clifton, Runcore, and Thellwalle. [40–46 *Hen.* 3. *m.* 1.]

40 Hen. 3. Bunnebury, Clemence, who was the wife of Patrick de, against Urian de Sancto Petro and Ydonea, his wife, Richard Bernard, Robert de Bulkeleg', John Harun, Richard, son of David, William Akchul, William, son of Dru, and William de Bunnebury. Dower. [40–46 *Hen.* 3. *m.* 1.]

40–46 Hen. 3. Malopas', David de. Extent and division of the lands, &c., of, in Bikeleg', Aggesale Wood, Hauton' and Bradeleg', between William, son of Robert Patrick, and Beatrice, his wife, one of the daughters and heirs of the said David, and Urian de Sancto Petro and Idonea, his wife, another of the daughters and heirs of the said David. [40–46 *Hen.* 3. *m.* 1.]

44 Hen. 3. Malopas', "Dominus" William de. Inquisition finding that the said William conferred by charter certain land in Hauton', together with a moiety of the mill of Eggerton, upon Roger, his son. [40–46 *Hen.* 3. *m.* 3.]

44 Hen. 3. Venables, "Dominus" Roger de. Inquisition of Assize touching the right of the said Roger to the presentation to the Church of Estbury, the Abbot and Convent claiming the same; finding that Randulph, late Earl of Chester, made the last presentation in right of William de Venables, then in his custody. [40–46 *Hen.* 3. *m.* 3, 12.]

44 Hen. 3. Littlebury, John de, and Roesia, his wife. Grant by, to John de Wetinhale, of all the lands the said John and Roesia had in the county of Chester. [40–46 *Hen.* 3. *m.* 3, 2 *d.*]

44 Hen. 3. Venables, Richard de. Inquisition of Assize, finding that the said Richard and Adam Chaplain, of Altbyr', were parceners of the town of Newbolt. [40–46 *Hen.* 3. *m.* 4.]

44 Hen. 3. Donn, Mabel, who was the wife of Richard de, against "Dominus" Roger de Venables, "Dominus" Thomas de Orreby, Richard, son of Richard de Donn, Emma, who was the wife of William Gerard, Avice de Thornton, and William Launcelin' and Joan, his wife. Dower of lands in Crowton and Kingsley. Dame Emma Kingel' vouches to warranty the "Dominus" Edward, guardian of Richard, son and heir of Richard de Donn. [40–46 *Hen.* 3. *ms.* 4, 9.]

—— The same against Avice, who was the wife of Randal le Ruter. Dower. [40–46 *Hen.* 3. *m.* 4.]

44 Hen. 3. Hona, Agnes, who was the wife of William, son of, against Richard del Hermitage', Thomas de Crawelach, Henry, son of Thomas, and Adam de Crow . . [Crouche ?]. Dower. [40–46 *Hen.* 3. *m.* 4.]

44 Hen. 3. Barton, Cicely, who was the wife of Gilbert de, against "Dominus" Eudo la Zuch and Peter de Ardern. Dower of a tenement in Modberleg'. [40–46 *Hen.* 3. *ms.* 6, 7.]

No. 4.—Welsh Records : Deeds, Inquisitions, &c.—*continued.*

44 Hen. 3. Pistor, Asota, who was the wife of William, against Sibyl de Lechton. [40–46 *Hen.* 3. *m.* 5.]

44 Hen. 3. Huxley, William de, and Agnes, his wife, grant by Charter all their land, tenements, &c., in Stapilford to "Dominus" Fulk de Orreby. [40–46 *Hen.* 3. *m.* 6.]

44 Hen. 3. Venator, Peter, and Agnes, his wife, grant all their lands and tenements in Waverton to "Dominus" Fulk de Orreby. [40–46 *Hen.* 3. *m.* 6.]

44 Hen. 3. Holebag', Sibyl, who was the wife of Jorvert de, against Hugh de Bikirton. Dower of a tenement in Bikirton. [40–46 *Hen.* 3. *m.* 7.]

44 Hen. 3. Clive, Cicely, who was the wife of Thomas de, against Richard, son of Adam de Clive, Robert, son of Agnes de Clive, Henry, son of Stephen de Clive, and Stephen de Clive. Dower. [40–46 *Hen.* 3. *m.* 8.]

44 Hen. 3. Walter, Margery, who was the wife of William, son of, against Matthew de Derisbury, Philip de Bostok, Amice, daughter of William de Bostok, Robert de Buddewrth, Peter de Warihull, Richard de Bulkil', Gervase de Medio Wico, the Abbot of Basingwerk, and the Prioress and Convent of the Nuns of Chester. Dower. [40–46 *Hen.* 3. *m.* 8.]

44 Hen. 3. Augustine, Avice, who was the wife of Andrew, son of, against Hamond de Pulford. Dower. [40–46 *Hen.* 3. *m.* 8.]

44 Hen. 3. Neuton, Margery, who was the wife of Thomas de, against Hugh son of the same Thomas, Nicholas, son of Nicholas de Frodisham, John, son of Nicholas, and John, son of Adam. Dower. [40–46 *Hen.* 3. *m.* 10.]

44 Hen. 3. Burwardesle, Matilda, who was the wife of David de, against Madoc de Burwardesle. Dower. [40–46 *Hen.* 3. *m.* 11.]

44 Hen. 3. Medio Wyco, the wife of Alexander de, against Philip Parvus, Martin Chaplain, Robert Hilchegrei, and Henry, son of Wlfrich. Dower. [40–46 *Hen.* 3. *m* 11.]

44 Hen. 3. Monte Alto, Cicely, who was the wife of "Dominus" Roger de, against the Abbot and Convent of Saint Werburg, Chester. Dower. [40–46 *Hen.* 3. *m.* 12.]

—— The same against Patrick de Neston. Dower of a tenement in Neston. The said Patrick vouches to warranty Robert, son and heir of the "Dominus" Roger de Monte Alto, in the custody of the Lord Edward. [*Ibid.*]

—— The same against Cicely, who was the wife of William de Gannok. Dower of a tenement in Brocton. [*Ibid.*]

44 Hen. 3. Lostok, Richard de. Charter of, granting all his land in the towns of Plumleg' and Lache to Richard, his son, the said Richard to render therefore yearly one pair of white gloves. [40–46 *Hen.* 3. *m.* 4. *d.*]

44 Hen. 3. Wenloc, John de, and Mabel, his wife. Charter of, granting to Robert Eyse all their share of the land which was of Richard, son of Ely Piscator, lying between the land of Ralph de Grenewey and that of the Nuns of Chester in "Le Grenewey;" and four selions of land in Claverton, one selion whereof lay upon "Le Helde," near the land of Robert de Pulford, and extended to "Mulnedich;" one selion upon "Longfeld," between the land of Robert de Pulford and the land of William Bunce; one selion in "Geffreishale," and extended to "Bromfeldiswey;" half a selion near "Le Gretedich," and touched on the way of Bromfeld; and half a selion in "Le Bothemes," between the land of the Hospital of St. John of Chester and the land of William Bunce, the said Robert to render therefore yearly one pair of white gloves. [40–46 *Hen.* 3. *m.* 5 *d.*]

44 Hen. 3. Rode, Hugh, son of Michael de. Charter of, granting to Margery, daughter of Geoffrey de Lostoc, all his right and claim to a moiety of the town of Rode, which was of the fee of Haulton, the said Margery to render yearly therefore one pair of white gloves or a halfpenny for all service. [40–46 *Hen.* 3. *m.* 5 *d.*]

44 Hen. 3. Littlebury, John de, and Roesia, his wife. Charter of, granting to John de Wetinhale all the land and tenements which they the said John and Roesia had or might have in the county of Chester. [40–46 *Hen.* 3. *m.* 5 *d.*] Randulph de Aldeton exhibits a Charter, by which he said that the said John and Roesia had granted to him a sixth part of the town of Munsull; the said John denies the validity of the Charter, as Roesia, prior to the same, had granted all her rights to him. The same with respect to a Charter exhibited by William Wodenot touching the serjeanty of Acton.

44 Hen. 3. Baggeleg', William, son of Peter de. Charter of, granting to John, son of Hammond de Baggeleg' that assart in the town of Baggeleg' called

No. 4.—Welsh Records : Deeds, Inquisitions, &c.—*continued.*

"Enesebrocflocis," which William de Baggeleg' by his Charter gave to the said Peter, the said John to pay yearly, at the term of St. Michael, 12*d.* for all services, saving that the said John should give yearly to the said William, at the same term, his third best pig when the pig could find mast for itself. [40–46 *Hen.* 3. *m.* 5 *d.*]

44 Hen. 3. Menegar', Thomas de, and Guionet de Provence, agree that a jury set out the bounds between Blakene and Salhale. The jury find that all the wood, "nemus," between Blakene and Salhale belonged to the town of Salhale, up to the outer oaks towards Blakene ; the oaks themselves to remain part of Salhale, and the plain beyond the wood, part of Blakene. [40–46 *Hen.* 3. *m.* 7 *d.*]

10 Edw. 1. Hankelow, "Hunekelowe," Agnes, who was the wife of Hugh de, against William de Hunekelow. Dower of one messuage and one bovate of land in Hankelow. [10 *Edw.* 1. *m.* 1 *d.*, 3 *d.*, 4, 4 *d.*, 6.]

10 Edw. 1. Pulford, Margaret, who was the wife of Kenewric' de, against Hugh de Pulford. Dower of one messuage, half a bovate and 16 selions of land in Pulford. [10 *Edw.* 1. *m.* 1 *d.*]

10 Edw. 1. Hatton, Christiana, who was the wife of Hugh de, against Hugh de Pulford. Dower of a fourth part of the town of Hatton. [10 *Edw.* 1. *m.* 2.]

—— The same against John de Mersinton and Sibil, his wife, of another fourth part of the same town. [*Ibid.*]

—— The same against Robert le Brun and Roger, son of Roger de Clotton, of another fourth part of the said town. [*Ibid.*]

10 Edw. 1. Hawerth, Isabel, who was the wife of William de, against John, Abbot of Vale Royal, and Randal, son of the same William. Dower of a moiety of the town of Leg'. [10 *Edw.* 1 *m.* 4.]

10 Edw. 1. Bickerton, Cecilia, who was the wife of Hugh de, against John, son of Kennereik, of Lanerketon, and David de Eggerton, his guardian. Dower of one messuage and 2½ selions of land in Clifbikerton. [10 *Edw.* 1. *m.* 4.]

—— The same against Richard Parvus and Alice, his wife, of one messuage and 2½ selions of land in the same town. [*Ibid.*]

—— The same against Eve, who was the wife of Kenewreik de Lanerketon, of four selions of land in the same town. [*Ibid.*]

—— The same against William, son of Richard de Clifbikerton, of one messuage and eight bovates of land, and of 32 pence and 6*d.* annual rents in the same town. [*Ibid.*]

—— The same against Richard, son of Hugh de Bikerton, of one messuage and 10 selions of land in the same town. [*Ibid.*]

10 Edw. 1. Limme, Margaret, who was the wife of Robert de, against William, son of Robert de Limme. Dower of one messuage and two bovates of land in Limme. [10 *Edw.* 1. *m.* 4.]

—— The same against Robert le Child, of one messuage and nine selions of land in Knotisford. [*Ibid.*]

—— The same against Godfrey Merelun, of a moiety of one messuage, two carucates of land, and a hundred acres of wood in Nordbury Both. [*Ibid.*]

10 Edw. 1. Hawerthin, Isabel, who was the wife of William de, against the Abbot of Vale Royal. Dower of a moiety of the town of Thuemelowe. [10 *Edw.* 1. *m.* 4, 6.]

10 Edw. 1. Knavenegrene, Emma, who was the wife of Robert de, against Hugh, son of Robert de Estbale and Matilda, his wife. Dower of one messuage and one carucate of land in Stokeport. [10 *Edw.* 1. *m.* 4.]

10 Edw. 1. Stanley, Hawisia, who was the wife of "Gamele' de," against Roger de Stanleg'. Dower of 12 acres of land in Stanleg'. [10 *Edw.* 1. *m.* 6.]

15 Edw. 1. Warren, William de. Inquisition taken on a "Mandamus" before Reginald de Grey, Chief Justice of Chester, on Tuesday next before the Feast of St. George. The jury say, that they know not whether the said William when he died held the lands of Brumfeld and Yal and the Castle of Dinasbran in his demesne as of fee or for life, but that Walter de la Mare and Robert de Tunle came by command of John de Warenne, Earl of Surrey, to Wrightisham on Thursday next after the Feast of St. Peter ad Vincula in the 12th year of Edw. 1, and delivered seisin of the aforesaid lands and castle to the same William, on behalf of the aforesaid Earl ; that the said Walter and Robert commanded all the tenants of the said Earl in Brumfeld and Yal to do homage and service to the said William in the name of the said Earl ; that the said William

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received the homage of the said tenants on that day, removing the bailiffs of the said Earl, and appointing bailiffs of his own, and gave certain of the demesne lands in the towns of Sessewich and Hunkel' to Madoc Gouth and David Gouth ap Houuel; that the same bailiff took a hundred marks from the commonalty as an aid, "de auxilio," and that the lands and castle were of the yearly value of four hundred marks. [15 *Edw.* 1. *m.* 1 *d.*]

15 Edw. 1. Milne, Stephen atte, and Giliana, his wife. Charter of, granting to Richard de Tudynham, citizen of Chester, and Felicia, his wife, their heirs and assigns, all their land lying between the land of Richard, son of Richard Clerk, late citizen of Chester, on the one hand, and the land of Margery Caumpeyn, on the other, in Watergate Street, in the city of Chester. [15 *Edw.* 1. *ms.* 1 *d.*, 5.]

15 Edw. 1. Middlewich, Christiana, who was the wife of Hugh, son of Walter de, against Thomas, son of Nicholas de Middlewich. Dower of three messuages and one garden in Middlewich. [15 *Edw.* 1. *ms.* 2, 2 *d.*, 4, 6.]

—— The same against John Corbet, of a moiety of one toft in Middlewich. [*Ibid. ms.* 4, 6.]

15 Edw. 1. Tarporley, "Torpele," Hawisia, who was the wife of William de, against Henry, son of Hugh de Torperle. Dower of one messuage and five acres of land in Torperle. [15 *Edw.* 1. *m.* 6.]

16 Edw. 1. Mainwaring, Alicia, who was the wife of Thomas de, against Hugh de Stoke. Dower of one messuage and one carucate of land in Over Peure. [15, 16 *Edw.* 1. *m.* 3.]

16 Edw. 1. Merton, Milsenc', who was the wife of Randal de, against Hugh de Merton. Dower of 10 acres of land and five acres of wood in Wollverton, near Bostok. [15, 16 *Edw.* 1. *m.* 3, 4.]

16 Edw. 1. Underwood, Richard de, and Sibyl, his wife. Charter of, granting to Robert Burnell, Bishop of Bath and Wells, all their claim to the wood called Otwode, between Cruue and Copinhal. [15, 16 *Edw.* 1. *m.* 3 *d.*]

16 Edw. 1. Clerk, Margery, who was the wife of Thomas, against John, son of William la Warde. Dower of two parts of 12 acres of land and one toft in Stapelforde Bruen. [15, 16 *Edw.* 1. *m.* 4 *d.*]

—— The same against Cecilia, who was the wife of William la Warde, of a third part of the said lands. [*Ibid.*]

16 Edw. 1. Holendene, Matilda, who was the wife of Geoffrey de, against Adam de Sunderland. Dower. [15, 16 *Edw.* 1. *m.* 4 *d.*]

16 Edw. 1. Clerk, Eva, who was the wife of Ralph, against Hugh de Malpas. Dower of one messuage and five selions of land in Malpas. [15, 16 *Edw.* 1. *m.* 5.]

—— The same against Roger de Trefford, of two burgages in Malpas. [15, 16 *Edw.* 1. *m.* 7.]

16 Edw. 1. Vernon, Felicia, who was the wife of Nicholas de, against Robert de Crosseleg' and Letitia, his wife. Dower of one messuage and one bovate of land in Whetecroft. [15, 16 *Edw.* 1. *m.* 7 *d.*]

16 Edw. 1. Malpas, Eva, who was the wife of Ralph de Malpas, against Ralph, son of Hugh de Malpas. Dower of one messuage and one acre and a half of land in Malpas. [16, 17 *Edw.* 1. *m.* 1.]

—— The same against Richard, son of Roger de Trofford, of two burgages in Malpas. [*Ibid.* 1 *d.*, 3.]

16 Edw. 1. Werburgh, Simon, Abbot of, and the Convent of the same place, and the Mayor and Citizens of Chester. Indenture between, regulating the holding of fairs. [16, 17 *Edw.* 1. *m.* 2.]

17 Edw. 1. Pinelesdon, Roger de, and Joan his wife, guardians of William, son and heir of Thomas de Venables, against the Abbot of Chester. Right of presentation to the Church of Astebury. [16, 17 *Edw.* 1. *m.* 3 *d.*]

17 Edw. 1. Birchel, Christiana, who was the wife of Henry de, against Henry, son of Henry de Birchel. Dower of one messuage and a moiety of one carucate of land in Birchel, near Hemdebur'; and against John, son of the aforesaid Henry de Birchel, of one messuage, three acres of land, and an eighth part of 100 acres of waste in the same town. The defendants vouched to warranty Vivian de Birchel, against whom the said Christiana recovered. [16, 17 *Edw.* 1. *m.* 4.]

17 Edw. 1. Wrench, Roger, and Matilda, his wife, against William de Tabbeley. Dower of 32½ acres of land in Tabbele-Superior. [16, 17 *Edw.* 1. *m.* 4.]

17 Edw. 1. Pulford, Matilda, who was the wife of Hugh de, against Robert Parson, of Codington. Dower of two messuages, two bovates of land, and six

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acres of meadow in Alderseye, near Codington. The said Robert vouches to warranty Robert, son of Hugh de Pulford and others. [16, 17 *Edw.* 1. *m.* 4 *d.*, *m.* 6 *d.*]

17 Edw. 1. Hasilwall, Agnes, daughter of Patrick de, who held a moiety of the town of Little Caldeye, of the gift of the aforesaid Patrick and Agnes, his wife, in fee to her and her heirs, quitclaims all her right to the same in favour of the aforesaid Patrick and Agnes, his wife, their heirs and assigns. [16, 17 *Edw.* 1. *m.* 4 *d.*]

17 Edw. 1. Crosseley, Robert de, and Letitia, his wife. Charter of, quitclaiming to Ralph de Vernun, son of Nicholas de Vernun, all their right to one bovate of land which the said Robert and Letitia had of Nicholas de Vernun in the town of Quatecroft. [16, 17 *Edw.* 1. *m.* 4 *d.*]

17 Edw. 1. Birchell, Henry de. Charter of, granting to Adam, his son, one place of land within the bounds of Alsach. [16, 17 *Edw.* 1. *m.* 4 *d.*]

—— Charter of Thomas, son of Henry, confirming the above Charter. [*Ibid.*]

17 Edw. 1. Northley, Hunitha, who was the wife of Roger de, against Richard Bulle, of Thornton. Dower of one messuage and 10 acres of land in Northley. The said Richard vouches to warranty John, son of Roger de Northley. [16, 17 *Edw.* 1. *m.* 5 *d.*]

17 Edw. 1. Pulford, Matilda, who was the wife of Hugh de, against Randal de Thornton, one of the guardians of Robert, son and heir of Hugh de Pulford. Dower of three messuages and five bovates of land in Newton, near Frodsham. [16, 17 *Edw.* 1. *m.* 5 *d.*]

—— The same, of one carucate of land and a moiety of one messuage in Aldersey, near Codington. [*Ibid. m.* 6.]

—— Against Reginald de Grey, of one bovate and 12 acres of land in Claverton. [*Ibid.*]

17 Edw. 1. Hellisby, Cecilia, who was the wife of Ralph de, against Ellen Donn. Dower of 8*s.* 8*d.* rent in Hellisby, and of five messuages, 30 acres of land, 60 acres of moor and waste, and two acres of meadow in Acton. [16, 17 *Edw.* 1. *m.* 6 *d.*]

17 Edw. 1. Pulford, Matilda, who was the wife of Hugh de Pulford, against Randal de Thornton. Dower of three messuages and five bovates of land in Newton, near Frodsham. The said Randal denies the right of dower, because the said tenement was given to the said Hugh by Robert le Chaumbleng in frank-marriage with Margery, his daughter, and prays judgment if the same Matilda, second wife of the said Hugh, ought to have dower of the marriage of the first wife. Judgment for the said Randal. [16, 17 *Edw.* 1. *m.* 7.]

17 Edw. 1. Arderne, John de Inquisition taken at Chester on Thursday next before the Assumption of St. Mary, in the seventeenth year of King Edward, finding that Warren de Mainwaring enfeoffed John de Arderne on Saturday, on the vigil of Pentecost last past, of his manors of Blakene and Ashton ; that on the following day the Escheator of Chester seised the manor of Blakene into the King's hands, and held it at the time of the making the Inquisition, the said Warren living, however, till the evening of the Tuesday following ; that the manor of Blakene was held of Richard de Harle and Burga, his wife, in capite, at 30*s.* yearly, who held the same of the heirs of Roger de Northfolke, who held the same of the heirs of William Patrik, who held the same of the lord the King in capite ; and that the said manor valued yearly 10*l.* Also that the same John had seisin of the aforesaid manor of Ashton on Sunday, on the Feast of Pentecost ; that the Escheator seized the same into the King's hands, and held the same at the time of taking the Inquisition ; that the said Warren held the said manor of Ralph de Vernun in capite ; that the said Ralph held the same of the King ; and that the said manor was of the yearly value of 10 marks. [16, 17 *Edw.* 1. *m.* 7 *d.*]

17 Edw. 1. Wylmislowe, Alice, who was the wife of William de, against Fynyan de Birtheles, on a plea of dower. [16, 17 *Edw.* 1. *m.* 8.]

17 Edw. 1. Deresbury, Margery, wife of Randall, to answer to Matilda, who was the wife of Hugh de Pulford. Dower. [16, 17 *Edw.* 1. *m.* 8.]

18 Edw. 1. St. Pierre, John de. Inquisition p.m. That the said John on the day he died, viz., Thursday next after the Feast of St. Lucy the Virgin, 18 Edw. 1, held in Bunbury half a carucate of land in demesne, a moiety of one mill in demesne, a moiety of the town of Bunbury in service, a 4th part of

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the town of Beeston in demesne, a moiety of the same town in service, a 4th part of the town of Bikerton in service, and a moiety of the town of Hortone in service; that all the aforesaid lands together were of the yearly value of 100*s.*, and were held of the Lord R., Bishop of Bath and Wells, by the service of half a knight's fee, and that the said John did homage to the said Bishop. Also that the said John held of Urian de St. Pierre and Robert, son of Griffin, and Beatrice, his wife, one moiety of Wynercote in demesne, and another moiety of Richard de Sutton and Isabel, his wife, in demesne, by the service of 2*s.* yearly, and that the said moieties valued yearly 8*s.* Also that the said John held of Urian de St. Pierre, a moiety of the manor of Little Egge in demesne, which valued yearly 26*s.* 8*d.* Also of Urian de St. Pierre, a 4th part of the town of Tylstan in demesne, which valued 20*s.* yearly. Also of Roger de Monte Alto, Little Maincote in demesne, by the service of a 5th part of a knight's fee, which valued 25*s.* yearly. Also that the said John died seised of the homage of John de Orreby for the manor of Chorltone, and that of Robert de Rideley for the manor of Ridelegh ; and that Urian was his son and heir, and of the age of 10 years. [16, 17 *Edw.* 1. *m.* 8 *d.*]

17 Edw. 1. Northley, Honutha, who was the wife of Roger de, against William Balle, of Thornton. Dower of 1 messuage and 10 acres of land in Northley ; and the said William vouches to warranty John, son of the aforesaid Roger. [16, 17 *Edw.* 1. *m.* 9.]

17 Edw. 1. Pulford, Matilda, who was the wife of Hugh de, against Robert Parson, of Coddington. Dower of 2 messuages, 2 bovates of land, and 6 acres of meadow in Aldreseye, near Coddington. The said Robert vouched to warranty Robert, son of Hugh de Pulford, in the custody of Richard de Stokeport, by grant of the King, part of the land being in the several custodies of Roger de Monte Alto, Peter de Arderne, Rotheric, son of Griffin, and Beatrice, his wife, and Randal de Thornton. [16, 17 *Edw.* 1. *m.* 9.]

16 Edw. 1. Clerk, Eva, who was the wife of Ralph, against Roger de Trogford. Dower. [16–25 *Edw.* 1. *m.* 1.]

16 Edw. 1. Venables, William de, Ralph de Vernoun, Patrick de Hasilwell, Hugh de Dutton, John de Sancto Petro, Reginald Doumvile, John de Orreby, knights, Alexander Baumvile, William de Brexin, John de Wetenale, William Gerad, Roger Throstell, William de Bonnebur', Robert de Breto, and John de Mottram. Inquisition taken at Chester on Tuesday next after the Ascension, 16 Edw. 1, setting forth the knights' fees held by the above, and the services due from them to the King during war time in Wales ; as also the services due from others whose names appear, together with the designation of the land, &c., for which they owe the said service ; the services due from the boroughs of Frodsham and Northwich and the Forest of Macclesfield are also set out. [16–25 *Edw.* 1. *m.* 1 *d.*]

18 Edw. 1. Clerk, Robert, son and heir of Philip. Inquisition taken before the Justice of Chester, 18 Edw. 1, setting forth the lands, &c., held of the King by the said Robert, and the services, &c., due for them. [16–25 *Edw.* 1. *m.* 2 *d.*]

19 Edw. 1. Stanlowe, Alfred, and Agnes, his wife. Charter of, granting to Matthew de Waleye all their lands and tenements in Northgate street, in the city of Chester. [16–25 *Edw.* 1. *m.* 9 *d.*]

21 Edw. 1. Little, Alice, who was the wife of Richard le, against Katherine who was the wife of John de St. Pierre. Dower. [20, 21 *Edw.* 1. *m.* 1.]

21 Edw. 1. Bonetable, Cecilia, who was the wife of Richard, against the Abbot of Vale Royal. Dower. [20, 21 *Edw.* 1. *m.* 1.]

21 Edw. 1. Tabley, William, son of William. Charter of, granting to John, "Dominus" de Grey, for life, all the said William's land in Upper Tabley. [20, 21 *Edw.* 1. *m.* 2.]

21 Edw. 1. Sutton, Edusa, who was the wife of Richard de Clerk, against Geoffrey, son of Robert, son of Dobbe. Dower of 5 acres of land in Runcore. [20, 21 *Edw.* 1. *m.* 2.]

21 Edw. 1. Prenton, Margaret, who was the wife of William de, against Patrick de Hasilwall. Dower. [20, 21 *Edw.* 1. *m.* 2.]

21 Edw. 1. Bahull', Agnes, who was the wife of Roger, against John de Leh'. Dower of 1 messuage and 10 acres of land in Brereton. [20, 21 *Edw.* 1. *m.* 5.]

21 Edw. 1. Little, Alice, who was the wife of Richard le, against Urian de St. Pierre. Dower of 1 messuage and 2 bovates of land in Parva Coten. The said

No. 4.—Welsh Records : Deeds, Inquisitions, &c.—*continued.*

Urian vouches to warranty David, son of Richard le Little. [20, 21 *Edw.* 1. *m.* 5 *d.*, 10, 11.]

21 Edw. 1. Gravenour, Margery, who was the wife of Robert le, against the Abbot of Vale Royal and Henry Dogeret. Dower. [20, 21 *Edw.* 1. *m.* 6.]

21 Edw. 1. Bonetable, Cecilia, who was the wife of Richard de, against the Abbot of Vale Royal. Dower. [20, 21 *Edw.* 1. *m.* 6.]

21 Edw. 1. Eyr, Emma, who was the wife of Richard le, against Amicia, who was the wife of Geoffrey Griffyn. Dower of a third part of 2 bovates of land in Betherton. The said Amicia vouches to warranty Geoffrey, son of the said Geoffrey. [20, 21 *Edw.* 1. *m.* 8, 10.]

21 Edw. 1. Trafford, Lora, who was the wife of Henry de, against Robert, son of Hugh de Pulford. Dower of 1 messuage and 5 bovates of land in Newton, near Kingesley. The said Robert vouches to warranty Henry, son of Robert. [20, 21 *Edw.* 1. *m.* 8.]

20, 21 Edw. 1. Stockport, Cecilia, who was the wife of Richard de, against Lucy, who was the wife of Roger de Stockport. Dower of 3 messuages and 20 acres of land in Hatteresl', of 9 messuages and 95 acres of land in Wernith', of 3 messuages and 50 acres of land in Bredebury, and of 4 messuages and 42 acres of land in Romel. The said Lucia vouches to warranty Joan and Matilda, daughters and heirs of Richard de Stokeport. [20, 21 *Edw.* 1. *m.* 11, 16.]

21 Edw. 1. Dutton, Peter ; Wetehale, John de ; Arderne, John de ; Venables, Hugh de ; Corona, John de. Inquisition ; taken before Reginald de Grey, Justice of Chester, upon a Writ of the 2nd Jan., 21 Edw. 1, setting forth that certain persons in the county of Chester had been guilty of contempt in not taking upon themselves knighthood according to the proclamation of the 18th Feb., 20 Edw. 1 ; finding that Peter de Dutton had 42 librates, 4 solidates, and 6 denarates of land in fee and inheritance in the said county, and was made a knight on the day of the Circumcision of our Lord, 1292, and had held his lands for 8 years ; that John de Wetehale had 41 librates, 10 solidates, of land in fee and inheritance in the same county, and was not a knight, and had held his lands for 70 years ; that John de Arderne had 40 librates and more of land in the same county, and was not a knight, and had not held his lands for half a year ; that Hugh de Venables had 40 librates of land and more in the same county, and was not a knight, and had held his lands for a year and a quarter ; and that John de Corona had 40 librates of land and more in the same county, and was not a knight, and had held his lands for half a year. [20, 21 *Edw.* 1. *m.* 11. *d.*]

21 Edw. 1. Moston, Michael de, and Alice, his wife, against Roger le Straunge. Dower of two bovates of land in Great Salghal, which were of Thomas, son of John de Magna Salhal, late husband of the said Alice. [20, 21 *Edw.* 1. *m.* 12.]

20, 21 Edw. 1. Bonetable, Cecilia, who was the wife of Richard, against the Abbot of Vale Royal. Dower of one messuage, 40 acres of land, 20 acres of wood, and 20 acres of Heath in Twemlowe. [20, 21 *Edw.* 1. *m.* 13, 15 *d.*]

21 Edw. 1. Griffin, Geoffrey, son of Geoffrey, and John le Paumer. The said John recognises the right of the said Geoffrey to an acre of meadow in Weston, near Berel, and the said Geoffrey grants to the said John and his heirs one messuage and one acre of waste land in Weston, in a place called "Crokemeresho," for the service of one rose yearly. [20, 21 *Edw.* 1. *m.* 14.]

21 Edw. 1. Eyr, Emma, who was the wife of Richard le, against Amicia, who was the wife of Geoffrey Griffin. Dower of two parts of two bovates of land in Berdynton. [20, 21 *Edw.* 1. *m.* 14 *d.*]

21 Edw. 1. Mere, Henry del, and Angaret, his wife, against Robert, son of Philip de Farendon, and Richard, his brother. Dower. [20, 21 *Edw.* 1. *m.* 14 *d.*]

20 Edw. 1. Little, Alice, who was the wife of Richard le, against Katherine, who was the wife of John de S. Pierre. Dower of one messuage and two bovates of land in Parva Coten. The said Katherine vouches to warranty Urian de St. Pierre. [20, 21 *Edw.* 1. *m.* 15.]

24 Edw. 1. Cheadle, Margaret, who was the wife of Geoffrey de, against Margery, who was the wife of Richard de Kynerdal. Dower of 2 messuages, 80 acres of land, and 100 acres of wood and waste in Cheadle. [23, 24 *Edw.* 1. *m.* 1, 13 *d.*]

24 Edw. 1. Cheadle, Margaret, who was the wife of Geoffrey de, against William de Toft. Dower of 11*s.* 8*d.* rent, and of the rent of two swine at mast-

No. 4.—Welsh Records : Deeds, Inquisitions, &c.—*continued.*

time, in Apilton. Against Hamond de Dutton ; Dower of the manor of Ashley, and of a moiety of the manor of Timperlegh, and a third part of one messuage and 40 acres of land in Hale ; and against Sibyl, who was the wife of Richard de Kenerdal ; Dower of three messuages, 100 acres of land, and 100 acres of wood and waste in Cheadle. [23, 24 *Edw.* 1. *m.* 1, 13 *d.*]

24 Edw. 1. Cheadle, Margaret, who was the wife of Geoffrey de, against Hamond, son of Geoffrey de Dutton. Dower of the manor of Ashley, of a moiety of the manor of Timperley, and of one messuage and 40 acres of land in Hale. Against William de Toft; Dower of 11*s.* 8*d.* rent, and of two pigs at mast-time, in Apilton. Against William, son of William de Mobberley ; Dower of one mill, six acres of land, and 30 acres of wood in Ashley. Against Richard son of Averey ; Dower of two messuages, 40 acres of land, and four acres of wood in Ashley. [23, 24 *Edw.* 1. *m.* 1 *d.*, 3 *d.*, 13 *d.*; 15–24, 25 *Edw.* 1. *m.* 18.]

24 Edw. 1. Barksford, Avicia, who was the wife of Hugh de Barkesford, against William Wodenot, of Barkesford, and Isabella, his wife. Dower of eight messuages, 30 acres of land, and 2*s.* rent in Barkisford. The said William and Isabella vouch to warranty Robert Wodenot. [23, 24 *Edw.* 1. *m.* 2, 8 ; 24, 25 *Edw.* 1. *m.* 13, 18.]

24 Edw. 1. Oldfield, Mabel, who was the wife of Adam, son of Margery del Oldefeld, against Hammond de Mascy. Dower of 20 acres of land and one "stallag' c'vis" in Donham, near Boudon. [23, 24 *Edw.* 1. *m.* 2 *d.*, 4 *d.*]

24 Edw. 1. Sumenur, Christiana, who was the wife of Adam le, against Stephen Dandy. [23, 24 *Edw.* 1. *m.* 2.]

24 Edw. 1. Praers, William de, and William de Macworth and Cicely, his wife. The said William and Cicely recognise the right of the said William de Praers to one messuage and four acres of land in Weston, near Bertomelegh, as of the gift and feoffment of the same William and Cicely. [23, 24 *Edw.* 1. *m.* 2 *d.*]

24 Edw. 1. Massey, William, son of Hamond, and John de Boydell. The said William acknowledges the right of the said John to two bovates of land in Hanlegh. [23, 24 *Edw.* 1 *m.* 2 *d.*]

24 Edw. 1. Barlow, Cicely, who was the wife of Henry de, against Gilbert de Ashton. Dower of two messuages, 16 acres of land, and one mill in Kennerthey. The said Gilbert vouches to warranty Roger del Plat, who says that no lands descended to him by the death of Henry de Barlowe his father, &c. [23, 24 *Edw.* 1. *m.* 2 *d.*, 4, 5, 7.]

24 Edw. 1. Cheadle, Margaret, who was the wife of Geoffrey de, against Margery, who was the wife of Richard de Kynerdale, guardian of the lands and heir of Richard de Kynerdale. Dower of 2 messuages, 80 acres of land, and 100 acres of wood in Cheadle. The said Margery vouches to warranty Roger, son and heir of Geoffrey de Chedle. [23, 24 *Edw.* 1. *m.* 3, 6, 8.]

24 Edw. 1. Sumenur, Christiana, who was the wife of Adam le, against Stephen Dandi. Dower. [23, 24 *Edw.* 1. *m.* 3.]

—— The same, against Felicia, who was the wife of John de Lughteburgh. [*Ibid.*]

24 Edw. 1. Stapleford, Alice, who was the wife of Philip, son of Thomas de, against Sibilla, daughter of Philip, son of Thomas de Stapelford. Dower of 1 messuage in Stapelford. [23, 24 *Edw.* 1. *m.* 4.]

24 Edw. 1. Oldfield, Mabel, who was the wife of Adam, son of Margery de, against Thomas de Hille. Dower of 15 acres of land in Donham, near Boudon. [23, 24 *Edw.* 1. *m.* 4 *d.*]

24 Edw. 1. Stockport, Ellen, who was the wife of Robert de, against Patrick de Haselwall and Lucy, his wife. Dower of 7 messuages, 2 carucates of land, 10 acres of meadow, 18 solidates rent, and of a third part of a water-mill in Wideford. The said Patrick and Lucy say that they held the aforesaid tenements in the name of dower of Cicely of the dower of Roger de Stokeport, her late husband, and vouch to warranty Joan and Matilda, daughters and heirs of Richard de Stokeport, &c. [23, 24 *Edw.* 1. *m.* 5.]

24 Edw. 1. Chany, Margaret, who was the wife of Adam, son of Adam, against Adam Chany. Dower of 5 messuages, 3 bovates of land, and 17 acres of land in Teverton ; and against Randal de Hulfeld, of 12 acres of land in the same town. The same Adam and Randal say that the aforesaid Margaret ought not to have dower, inasmuch as she absented herself from her

No. 4.—Welsh Records: Deeds, Inquisitions, &c.—*continued.*

husband and lived in adultery with one William, son of Pimme, &c. Jury say that the said Margaret was reconciled to the aforesaid Adam after she had lived in adultery with the said William, son of Pimme, &c. [23, 24 *Edw.* 1. *m.* 5 *d.*]

24 Edw. 1. Kinerdale. Sibyl, who was the wife of Richard de, against Sibyl, daughter of Richard de Kinerdale, that she warrant to the said Sibyl a third of 3 messuages, 100 acres of land, and 100 acres of wood and waste, which Margaret, who was the wife of Geoffrey de Cheadle, claimed in dower. [23, 24 *Edw.* 1. *m.* 5 *d.*]

24 Edw. 1. Cheadle, Margaret, who was the wife of Geoffrey de, against Hamond de Dutton. Dower of the manor of Ashley, and of a moiety of the manor of Tymperlegh, and of 1 messuage and 40 acres of land in Hale. [23, 24 *Edw.* 1. *m.* 5 *d.*]

24 Edw. 1. Dunham, Mabel, who was the wife of Adam, son of Margery de, against David de Hulton. Dower of 1 messuage and 13 acres of land in Dunham, near Boudon. [23, 24 *Edw.* 1. *m.* 6, 8.]

—— The same against Thomas de Hulle. A third of one messuage and 40 acres of land in Dunham. [24, 25 *Edw.* 1. *m.* 15.]

24 Edw. 1. Sumenur, Christiana, who was the wife of Adam le, against Stephen Dandi. Dower of a third part of 1 messuage in Middlewich. The said Stephen vouches to warranty Thomas, son and heir of the aforesaid Adam. [23, 24 *Edw.* 1. *m.* 6.]

24 Edw. 1. Ingeniator, Master Richard, and Hugh Peyn. The said Hugh acknowledges the right of the said Richard to 3 messuages and 50 acres of land in Hale, and for such acknowledgment the said Richard grants the said tenements to the said Hugh and Matilda, his wife. [23, 24 *Edw.* 1. *m.* 6.]

24 Edw. 1. Merbury, John de, and John de Walton and Alice, his wife. The said John de Walton and Alice acknowledge the right of the same John to 10 acres of land in Coleshull, as of the gift and feoffment of the same John and Alice. [23, 24 *Edw.* 1 *m.* 7.]

24 Edw. 1. Bridsmere, Matilda, who was the wife of Henry de, against Philip de Cheswin and Isabel, his wife. Dower of 1 messuage and 3 acres of land in Bridsmere. [23, 24 *Edw.* 1. *m.* 8.]

24 Edw. 1. Sumenur, Christiana, who was the wife of Adam le, against Stephen Dandi. Dower of a third part of 1 messuage in Middlewich. The said Stephen vouches to warranty Emma, who was the wife of Richard Lodelin, who says that she held the aforesaid tenement in dower of the inheritance of Thomas, son of Adam le Sumenour. [23, 24 *Edw.* 1. *m.* 8.]

24 Edw. 1. Legh, Beatrice, who was the wife of Hugh de, against Ralph de Coghull and Alice, his wife. Dower of 3 messuages, 14 acres of land, in Legh, near Darrington. The said Ralph and Alice vouch to warranty John, son of Hugh de Legh. [23, 24 *Edw.* 1. *m.* 8.]

24 Edw. 1. Dounham, Mabel, who was the wife of Adam, son of Margery, against David de Hulton. Dower of 1 messuage and 13 acres of land in Dunham, near Boudon. [23, 24 *Edw.* 1. *m.* 8.]

24 Edw. 1. Elton, Margery, who was the wife of Thomas de, against Thomas, son of Thomas de. Dower of 8 messuages and 8 bovates of land in Elton; and against Robert, son of Thomas de, dower of 2 messuages, 4 bovates of land, and 2 acres of meadow in the same town; and against Richard, son of Peter le Ruter, dower of 2 messuages in the same town. [23, 24 *Edw.* 1. *m.* 9.]

24 Edw. 1. Cheadle, Margaret, who was the wife of Geoffrey de, against Sibil, who was the wife of Richard de Kynerdale. Dower of 3 messuages, 100 acres of land, and 100 acres of wood and waste in Cheadle, and the said Sibyl vouches to warranty Sibyl, daughter of Richard, son of Richard de Kinerdale. [23, 24 *Edw.* 1. *m.* 9.]

—— The same against Sibyl, daughter of Richard, son of Richard de Kynerdale. Dower of 2 messuages, 40 acres of land, and 80 acres of wood and waste in the same town. [*Ibid.*]

24 Edw. 1. Stokeport, Elice, who was the wife of Robert de, against Patrick de Haselwell and Lucy, his wife. Dower of 7 messuages, 2 carucates of land, 1 mill, 7*s.* of rent, and 16 acres of meadow in Wyndeford. [23, 24 *Edw.* 1. *m.* 9 *d.*]

24 Edw. 1. Tailbor, Cicely, who was the wife of Henry le, against Robert de Bosedon. Dower of 1 acre of land in Stokeport. [23, 24 *Edw.* 1. *m.* 9 *d.*]

—— The same against Adam, son of Llewelin. Dower of 2 burgages in the same town. [*Ibid.*]

No. 4.—Welsh Records : Deeds, Inquisitions, &c.—*continued.*

24 Edw. 1. Sumenur, Christiana, who was the wife of Adam le Sumenur, against Felicia, who was the wife of Richard de Croxton. Dower of 2 parts of 1 messuage in Middlewich ; the said Felicia vouches to warranty John, son of John de Lughteburgh. [23, 24 *Edw.* 1. *m.* 9 *d.*]

24 Edw. 1. Basset, Ralph, and Margaret, his wife, late wife of Urian de St. Pierre against John de Grey, guardian of the lands and heir of Urian de St. Pierre. Dower of the manor of Aud . . . of a 6th part of the manors of Shipbroke, Davenham, and Leftwych ; of a 6th part of the manor of Hurdeleston ; of 1 carucate of land in Halghton, Sporstowe, and Ridle ; of a 12th part of 2 water mills, 40 acres of land and 50 acres of wood, in the same town, and of 4 messuages and 32 acres of land in the same town. [23, 24 *Edw.* 1. *m.* 10.]

24 Edw. 1. Baggeley, Matilda, who was the wife of Hamond, son of John de Baggeley, against William de Baggeley. Dower. [23, 24 *Edw.* 1. *m* 12 *d.*]

24 Edw. 1. Dutton, Geoffrey, son of Geoffrey. Charter by which the said Geoffrey, in consideration of 3 marks of silver, and 1 salt pit in Le Northwich, which Robert de Denby and Margaret, his wife, had given to him, grants, for himself and his heirs, to the said Robert and Margaret and their heirs, all his right "de Helda in 'Estova' una cum Wetehale" and Little Tabbeleg, the said Robert and Margaret to do the accustomed homage and service for the same, viz., "pro Helda" one pair of gilt spurs, for "Wetale" one pair of white gloves. [23, 24 *Edw.* 1. *m.* 10.]

24 Edw. 1. Pende, Petronilla, who was the wife of Robert le Pende Mercer, against Hugh, son of Robert le Pende Mercer, whom Robert de Bekyngton and Margery, his wife, had vouched to warranty. Dower of 3 messuages and 3 bovates of land, and 1 fishery, in Salghill. [23, 24 *Edw.* 1. *m.* 12.]

24 Edw. 1. Stokeport, Ellen, who was the wife of Robert de, against Patrick de Haselwall and Lucy, his wife. Dower of seven messuages, 2 carucates of land, 18*s.* rent, a third part of 1 mill, and 10 acres of meadow in Wydeford. [23, 24 *Edw.* 1. *m.* 13.]

24 Edw. 1. Sumenur, Christiana, who was the wife of Adam le, against Felicia, who was the wife of Richard de Croxton. Dower of 2 parts of 1 messuage in Middlewich. The said Felicia vouches to warranty John, son of John de Luttebur. [23, 24 *Edw.* 1. *m.* 14.]

—— The same against Thomas Dandy. Dower of a third part of 1 messuage in Nantwich. The said Stephen vouches to warranty Emma, who was the wife of Richard Dodefin. [*Ibid.*]

24 Edw. 1. Taylor, Cicely, who was the wife of Henry le, against Robert de Bosendon. Dower of 1 acre of land in Stokeport ; and against Adam Limekin, dower of 2 burgages in Stokeport. [23, 24 *Edw.* 1. *m.* 14.]

24 Edw. 1. Crue, Joan, daughter of Thomas de Crue, and Avisia, her sister, summoned to vouch to David de Crue a third of 7 messuages and 40 acres of land in Crue ; to Robert de Thykenesse, a third of 3 messuages and 50 acres of land in the same town ; to Sibyl de Crue, a third of 9 messuages and 2 carucates of land in Aston, near Worleston ; to Patrick de Crue, a third of 7 messuages and 50 acres of land in the same town ; to Thomas, son of Nicholas de Crue, a third of 3 messuages and 9 acres of land in the same town and in Nantwich ; to Henry, son of John le Bule, a third of 2 messuages and 4 bovates of land in Chorlton, in Wyrhal ; to Thomas de Wevere, and Roesia, his wife, a third of 4 messuages, 1 bovate of land, 11*s.* 8*d.* rent, in Aston & near Worleston, Horepull, and Mannelegh, which Avice, who was the wife of Thomas de Crue, claimed as dower. [23, 24 *Edw.* 1. *m.* 14, 16 *d.*]

24 Edw. 1. Legh, Beatrice, who was the wife of Hugh de, against Ralph de Coghull and Alice, his wife. Dower of 3 messuages and 18 acres of land in Legh near Uttrington. The said Ralph and Alice vouch to warranty John son of Hugh de Legh. [23, 24 *Edw.* 1. *m.* 16.]

24 Edw. 1. Sumenur, Christiana, who was the wife of Adam le, against Stephen Dandy. Dower of 1 messuage in Middlewich. The said Stephen vouches to warranty Henry de Stanthurll and Emma, his wife. [23, 24 *Edw.* 1. *m.* 16.]

24 Edw. 1. Toft, William de, against Geoffrey, son of Geoffrey de Cheadle, that he warrant to him a third of 11*s.* 8*d.* rent in Appelton, and the rent of a third of two swine at mast-time, &c., which Margaret, who was the wife of Geoffrey de Chedle, claimed in dower. [23, 24 *Edw.* 1. *m.* 16.]

No. 4.—Welsh Records : Deeds, Inquisitions, &c.—*continued.*

24 Edw. 1. Bertherton, Margery, who was the wife of Adam de, against Geoffrey Griffin. Dower of four messuages, two carucates of land, 60 acres of wood, and five acres of meadow. [23, 24 *Edw.* 1. *m.* 16.]

24 Edw. 1. Cherleton, Thomas, son of Thomas, son of Robert de. Charter of, granting to Simon, his son, in fee-tail all his the said Thomas' land, &c., within the bounds of the town of Weston, as set forth in a Charter of Robert de Praers to the said Thomas, with remainder to the eldest son of the said Thomas and Emma, his wife, and the heirs of his body, and, them failing, to the said Emma, and at her death to the next heirs of the said Thomas. [23, 24 *Edw.* 1. *m.* 16 *d.*]

25 Edw. 1. Chester Palatinate. Inquisition taken on Tuesday next after the Feast of St. Matthew the Apostle, in the 25th year of Edw. 1, on Writ to Reginald de Grey to make Inquisition touching the custody of the lands and wardship of the heirs of those who held in soccage, and of the heirs of those who held part of their lands in soccage of others and part in capite of the Earl of Chester. Finding that from the time whereof the memory of man was not to the contrary, up to the time of the inquisition, the lands and tenements in the county of Chester held in soccage were, on the death of the tenants and during the minority of their heirs, held by the nearest relations of the same heirs, although the said tenants might have held other lands elsewhere of the Earls of Chester by knight's service, and that the said relations had the right of presentation to all advowsons pertaining to the said lands; that no Earl of Chester, in time past or present, had the right of custody of any land, saving that held immediately of such Earls by knight's service ; that every "dominus privatus" in the county of Chester after the death of his tenant, who held of him by knight's service, had the custody of the lands of the said tenant during the minority of the heir, although the same tenant held other lands of the Earl of Chester by like service ; that the bailiffs and escheators of the Earls of the county aforesaid had never taken such inheritances into the hands of the aforesaid Earls ; that there was no obstacle against the custom aforesaid until the then King Edward, when it happened that the hundred of Macclesfield fell to Eleanor, late Queen of England, the King's consort, by gift of the said King, and the bailiff of the said Eleanor for the hundred aforesaid, on the death of Richard de Orreby, who held a certain forestry in the aforesaid hundred of the King in capite, and the manor of Gouseworth of Peter de Ardern, seized the aforesaid forestry, together with the aforesaid manor, into the King's hands, but that the said Peter recovered the said manor out of the King's hands by virtue of the custom. Memorandum, that the Rolls of the Exchequer had been examined, and nothing found which could operate in favour of the King's right to such custody, or contradict the finding of the foregoing Inquisition. [24, 25 *Edw.* 1. *m.* 1 *d.*]

25 Edw. 1. Russell, Roger, prays to plevin a third of one messuage in Nantwich, which Matilda, who was the wife of William Tredefen, claimed in dower against the aforesaid Roger and Margery, and which by their default was taken into the King's hands. [24, 25 *Edw.* 1. *m.* 2.]

25 Edw. 1. Dunham, Mabel, who was the wife of Adam, son of Margery de, against Hamond de Mascy, whom David de Hulton vouched to warranty. Dower of one messuage and 40 acres of land in Dounham. [24, 25 *Edw.* 1. *m.* 3, 6.]

25 Edw. 1. Halle, Maria, who was the wife of Alan del Halle, against the Prior of Birkenhead. Dower of two messuages and four bovates of land in Kyrkebye in Waleye. Also against Robert, son of Alan del Halle ; Dower of two messuages and 4 bovates of land in Kyrkebye in Waleye. [24, 25 *Edw.* 1. *m.* 6.]

25 Edw. 1. Tegge, Margery, who was the wife of Thomas, son of, against Richard de Herthull. Dower of 15 acres of land in Herchull. [24, 25 *Edw.* 1. *m.* 8.]

25 Edw. 1. Dunham, Mabel, who was the wife of Adam, son of Margery de, against David de Hylton, whom Thomas de Hull vouched to warranty. Dower of one messuage and of 40 acres of land in Dunham. [24, 25 *Edw.* 1. *ms.* 10, 11.]

25 Edw. 1. Barkesford, Avicia, who was the wife of Hugh de, against William Wodenot, father of Robert Wodenot, whom Robert Wodenot vouched to warranty, who vouched to William Wodenot and Isabel, his wife, a third of 8 messuages 30 acres of land, and 2s. rent in Barkesford, which the said Avice claimed, as dower. [24, 25 *Edw.* 1. *m.* 11.]

No. 4.—Welsh Records: Deeds, Inquisitions, &c.—*continued.*

25 Edw. 1. Pulford, "Polford," Robert, son of Hugh de, confirmation by, of a Charter of Robert, late Lord of Polford, the said Robert's great-grandfather, granting certain lands in Pulford to the Abbot and Monks of Pulton. [24, 25 *Edw.* 1. *m.* 11.]

24 Edw. 1. Launcelin, William. Charter of, granting to Master Robert de Frodsham 1 assart in Newton-in-the-Forest, lying near Smaleshate, which assart Richard, brother of the aforesaid Robert, formerly held of the said William. [24, 25 *Edw.* 1. *m.* 17.]

24 Edw. 1. Cheadle, Margery, who was the wife of Geoffrey de, against Hamond de Dokenfeld and Sibil, his wife. Dower of one messuage, 40 acres of land, 20 acres of wood, and 40 acres of moor and heath in Cheadle. The said Hamond and Sibil vouch to warranty Sibyl, daughter of Richard de Kinerdale, who vouches to warranty Roger, brother and heir of Geoffrey Chedle, son of Geoffrey de Chedle. [24, 25 *Edw.* 1. *m.* 18.]

26 Edw. 1. Bradford, Margery, who was the wife of Robert de Bradeford, against Reginald de Grey. Dower of one carucate of land in Marlston. The said Reginald vouches to warranty Robert, son and heir of the aforesaid Robert. [25, 26 *Edw.* 1. *m.* 1.]

26 Edw. 1. Davenport, Maria, who was the wife of Roger de, against Thomas de Neuton and Roger de Turnok. Dower. [25, 26 *Edw.* 1. *m.* 1.]

26 Edw. 1. Wodenot, Margaret, who was the wife of Henry, against William Wodenot, Randal Laworthin, William le Glovere, and John, son of Rose. Dower. [25, 26 *Edw.* 1. *m.* 2.]

26 Edw. 1. Cherlton, Thomas. An Assize of Mort d'Ancestre finds that the said Thomas died seised in his demesne as of fee of one messuage, eight acres of land, two acres of wood, and one acre of moor in Weston, near Bertomlegh, and that John de Cherlton should recover possession of the same as son and heir of the said Thomas. [25, 26 *Edw.* 1. *m.* 1.]

26 Edw. 1. Alsacher, Beretreda, who was the wife of Randal de Alsacher, against Thomas, son of Adam, son of Julian. Dower of four acres of land in Alsacher. [25, 26 *Edw.* 1. *m.* 2.]

—— The same against Henry, son of William de Badeleg'. Dower of 12 acres of land in Alsacher. [*Ibid.*]

—— The same against Adam de Lawton and Alice, his wife. Dower of 24 acres of land in Alsacher. [*Ibid.*]

26 Edw. 1. Alsacher, Beretreda, who was the wife of Randal de, against Henry de Mowell and Robert, his son. Dower of one messuage, 80 acres of land, and 12*s.* of rent in Alsacher. The said Henry vouches to warranty William, son and heir of the aforesaid Randal. [25, 26 *Edw.* 1. *m.* 2.]

—— The same against Richard King. Dower of seven acres of land, 5*s.* rent, two acres of meadow, and one acre of heath. The said Richard vouches to warranty William, son and heir of the said Randal. [*Ibid.*]

26 Edw. 1. Burmyngham, Isabel, who was the wife of William de, against Peter de Chalons. Dower. [25, 26 *Edw.* 1. *m.* 2, *d.*]

26 Edw. 1. Somerford, John, son of Thomas de, against Bertreda, who was the wife of Randal de Alsacher. Dower. [25, 26 *Edw.* 1. *m.* 3.]

26 Edw. 1. Alsacher, Bertreda, who was the wife of Randal de, against Alice de Orme & Shalgh. Dower of 12 acres of land in Alsacher. [25, 26 *Edw.* 1. *m.* 3.]

—— The same against William de Smalle and Avicia, his wife, and Richard, son of Nicholas, son of Hudde. Dower of 12 acres of land. [*Ibid.*]

—— The same against Richard, son of Adam de Neubold, and Robert, his brother. Dower of 3 acres of land. [*Ibid.*]

—— The same against William Harding and William, his son. Dower of 20 acres of land and 2 acres of meadow. [*Ibid.*]

—— The same against William, son of Randal. Dower of 1 bovate and 2 acres of land and 5*s.* rent in "the same town." [*Ibid.*]

NOTE.—The Roll does not always state the locality, but from the last entry it may be inferred that all the land was in Alsacher.

26 Edw. 1. Payn, Richard, and Matilda, who was the wife of Hugh Payn. The said Matilda acknowledges 4 messuages, 2 carucates, and 12 acres of land in Hole and Wodeford to be the right of the said Richard, in consideration whereof the said Richard grants the same to the said Matilda for life, with reversion to the said Richard. [25, 26 *Edw.* 1. *m.* 4.]

26 Edw. 1. Haselwell, Patrick de, Knight. Deed between the said Patrick, on the one part, and William, son of the same Patrick, on the other, by which the said William grants for life to the aforesaid Patrick, his father, the manor

No. 4.—Welsh Records : Deeds, Inquisitions, &c.—*continued.*

of Thurstaneston, with its appurtenances, excepting 2 bovates of land, 1 grange, 1 place of land adjacent, and a certain "valle" called Steyncolesdale, which said manor the said William had of the gift of his said father; the said manor, on the death of the said Patrick, to revert to the said William, his heirs and assigns. [25, 26 *Edw.* 1. *m.* 4 *d.*]

26 Edw. 1. Alsacher, Bertreda, who was the wife of Randal de, against Adam, son of Thomas de Somerford. Dower of 1 messuage and 10 acres of land in Alsacher. [25, 26 *Edw.* 1. *m.* 5.]

—— The same against Margery, who was the wife of Thomas de Somerford. Dower of 10 acres of land in Alsacher. [*Ibid.*]

—— The same against Henry le Wolf. Dower of 12 acres of land in the same town. [*Ibid.*]

—— The same against Thomas de la Bache and Margery his wife. Dower of 4 acres of land in the same town. [*Ibid.*]

—— The same against Ralph, son of Randal. Dower of 2 messuages, 12 acres of land in Alsacher. [*Ibid.*]

—— The same against William de Alsacher. Dower of 2 messuages, 2 carucates of land, 80 acres of waste, 4 acres of meadow, and 40*s.* rent in Alsacher. [*Ibid.*]

26 Edw. 1. Bermyngham, Isabel, who was the wife of William de, against Peter de Chalons. Dower of a moiety of the manor of Chirchcristleton. The said Peter vouches to warranty William, son of William de Bermingham. [25, 26 *Edw.* 1. *m.* 6, 6 *d.*]

26 Edw. 1. Dutton, Hugh, son of Hugh. Proof of age. [25, 26 *Edw.* 1. *m.* 11 *d.*]

26 Edw. 1. Donn, Henry, and Cecilia, his wife, against Robert de Rode. Dower. [25, 26 *Edw.* 1. *m.* 14.]

26 Edw. 1. Cherlton, Emma, who was the wife of Thomas, son of Thomas de, against Ralph Basset, Margaret his wife, and John, son of Thomas de Cherlton. Dower of 1 messuage and 1 bovate of land in Cherlton, near Wybunbury; and against Ralph Basset, and Margaret, his wife, Dower of 1 messuage and 1 bovate of land in the same town. [25, 26 *Edw.* 1. *m.* 15.]

26 Edw. 1. Tredefen, Matilda, who was the wife of William, against Roger Russell and Margery, his mother. Dower of one messuage in Wich-Malbank. [25, 26 *Edw.* 1. *m.* 15.]

26 Edw. 1. Wodenot, Margaret, who was the wife of Henry, against William Wodenot, Matilda, his wife, and Ellen, son of the aforesaid William. Dower of 1 messuage, 2 carucates of land in Burlond. [25, 26 *Edw.* 1. *m.* 15.]

27 Edw. 1. Verrour, Margery, who was the wife of Simon le, against Richard, son of Peter le Roter. Dower of 1 messuage and 1 acre and a half of land in Thornton on the Moor. The said Richard pleads that he has no claim to the said messuage and land but as the guardian of Richard, son of the said Richard. [27 *Edw.* 1. *m.* 1.]

27 Edw. 1. Clyve, Sibyl, who was the wife of Warren de Clyve, against Randal, son of Hugh de Merton. Dower of 8 acres of land in Clyve. The said Hugh pleads that he has no other claim to the said land than by a lease of the same from Henry, son and heir of Warren de Clyve, whom he vouches to warrant. [27 *Edw.* 1. *m.* 1.]

27 Edw. 1. Stubbes, Philip, son of David de. Deed of, granting to Nicholas, his brother, his heirs and assigns, all the right the said Philip had of the gift of Margery, his mother, to certain land in Stubbes. [27 *Edw.* 1. *m.* 1 *d.*]

27 Edw. 1. Wodenot, Matilda, who was the wife of William, against Randal, son of William Wodenot. Dower of the manor of Shavington. It is found that the said William, husband of the said Matilda, was not possessed of the said manor after his marriage with Matilda. [27 *Edw.* 1. *m.* 2.]

27 Edw. 1. Wolfhull, Morella, who was the wife of Adam de, against William Byle and Felicia, his wife. Dower of one messuage in Wolfhull. The said William and Felicia vouch to warranty William, son and heir of Adam de Wolfhull. [27 *Edw.* 1. *m.* 2. *m.* 5 *d.*]

27 Edw. 1. Pipot, Agnes, who was the wife of Richard, against William de Venables. Dower of 30 acres of land in Routhesthorn. [27 *Edw.* 1. *m.* 4.]

27 Edw. 1. Randal, Margery, who was the wife of Ralph, son of Robert, son of Randal, against John, son of Ralph, son of Clement. Dower of one messuage in Wich-Malbank; and against Randal Russel, dower of two messuages and of a moiety of one salt-pit in the same town. [27 *Edw.* 1. *m.* 4.]

27 Edw. 1. Whitenele, Masey de. Deed of, granting to William de Milton for life six acres of land "in campo de Claverton," late of Thomas Hose. [27 *Edw.* 1. *m.* 4. *d.*]

No. 4.—Welsh Records: Deeds, Inquisitions, &c.—*continued.*

27 Edw. 1. Rode, Agnes, who was the wife of Henry, son of Gilbert de, against William, son of Randal de Hertford. Dower of one messuage and two bovates of land in Hertford. [27 *Edw.* 1. *m.* 9.]

27 Edw. 1. Bradeleg', Hawisia, who was the wife of John de, against Nicholas, son of Thomas Gamell, of Frodsham. Dower of four acres in Upper Bradeleg, near Frodsham. [27 *Edw.* 1. *m.* 9.]

27 Edw. 1. Bothe, Lisia, who was the wife of Adam del, against William, son of Ademet, and Alice, who was the wife of Gilbert de Brereton. Dower. [27 *Edw.* 1. *m.* 9.]

—— The same, against William Ademet del Bothe, and Thomas, his brother. Dower of one messuage and 12 acres of land in Brereton and Bradewall. [27 *Edw.* 1. *m.* 9.]

27 Edw. 1. Burlond, Siward de. Charter of, granting to the Abbot and Monks of Cumbermere and their successors, in frank-almoigne, a certain place of land in Burlond, with a house situated thereon, which the said Monks had chosen in a certain field near the house of the said Siward, towards the south, whereon to build a grange. [27 *Edw.* 1. *m.* 12 *d.*]

27 Edw. 1. Alsacher, Bertreda, who was the wife of Randal de Alsacher, against Richard, son of Nicholas, son of Hugh, and Alice, mother of the aforesaid Richard. [27 *Edw.* 1. *m.* 13.]

27 Edw. 1. Venables, William de. Grants the advowson of the Church of Astbury to Thomas, Abbot of St. Werburgh, and his Church. [27 *Edw.* 1. *m.* 13 *d.*]

27 Edw. 1. Donn, Henry and Cicely, his wife. A plea having been moved between "Dominus" John de Grey, guardian of the land and heir of Robert de Morton on the one part, and the said Henry and Cicely on the other, that the said Henry and Cicely had more in dower than they ought to have, and more than belonged to the said Cicely to have of the heirs of the aforesaid heir, in Morton. As a solution of the said plea, the said "Dominus" John grants that the said Henry and Cicely should have and hold the dower which they then held, and the said Henry and Cicely, in consideration of the same, agree to pay to the said "Dominus" John 40*s.* yearly until the coming of age of the aforesaid heir. [27 *Edw.* 1. *m.* 16. *m.* 17.]

27 Edw. 1. Alsacher, William, son and heir of Richard de, vouched to warranty by Richard King, on a plea of dower of Beretr', who was wife of Randal de Alsacher. [27 *Edw.* 1. *m.* 17.]

27 Edw. 1. Alsacher, William, son and heir of Richard de, vouched to warranty by Richard Harding', on a plea of dower of Beretr', who was the wife of Randal de Alsacher. [27 *Edw.* 1. *m.* 17.]

27 Edw. 1. Alsacher, Beretr', who was the wife of Randal de Alsacher, against Henry de Badileg', of a dower. [27 *Edw.* 1. *m.* 17.]

27 Edw. 1. Grey, John de, guardian of the lands and heir of Robert de Moreton, against Henry Donn and Cicely, his wife, of a plea of dower. [27 *Edw.* 1. *m.* 17.]

27 Edw. 1. Alsacher, Beretr', who was the wife of Randalde, against Alice de Ormeshalg. Dower, a third part of 12 acres of land in Alsacher. [27 *Edw.* 1. *m.* 17.]

27 Edw. 1. Alsacher, Beretr', who was the wife of Randal de, against Henry, son of William de Baddileg'. Dower of 12 acres of land in Alsacher. [27 *Edw.* 1. *m.* 17 bis, 18.]

27 Edw. 1. Alsacher, Bertreda, who was the wife of Randal de, against William Small and Avice, his wife. Dower. [27 *Edw.* 1. *m.* 18.]

27 Edw. 1. Alsacher, Bertreda, who was the wife of Randal de Alsacher, against Henry de Mowell and Robert, his son. Dower of 20 acres of land in Alsacher. The said Henry vouches to warranty Randal, son and heir of the said Randal. [27 *Edw.* 1. *m.* 18.]

27 Edw. 1. Malpas, "Malo Passu," Henry, son of Roger de, against John de Warewyk. 3 messuages, 1½ salt-pit, and 3 acres of land in Malpas, Wygelond, Upper and Lower Fulwich, and Bradelegh, demised to the said John during the minority of the said Henry. [27 *Edw.* 1. *m.* 18.]

27 Edw. 1. Weston, Michael, son of Roger de. Charter of, granting to William de Praers all the lands and tenements which the said Michael had or could have in the town of Weston. [27 *Edw.* 1. *m.* 18 *d.*]

28 Edw. 1. Batecok, Edusa, who was the wife of Henry, son of Batecok, against William, son of Henry, son of Batecok. Dower of 1 messuage and 20 acres of land in Fadilegh. [27, 28 *Edw.* 1. *m.* 1; 28, 29 *Edw.* 1. *m.* 1.]

No. 4.—Welsh Records : Deeds, Inquisitions, &c.—*continued.*

28 Edw. 1. Arderne, Ellen, who was the wife of Thomas de, against Roderic, son of Griffin and Katherine, his wife. Dower of 4 messuages, 7 bovates of land, 80 acres of wood, 120 acres of pasture, and 10 solidates of rent in Northbur', near Merbur'. [27, 28 *Edw.* 1. *m.* 2 ; 28, 29 *Edw.* 1. *m.* 6, 7.]

—— The same. The said Roderic and Katherine vouch to warranty Thomas, son of Thomas de Arderne. [28, 29 *Edw.* 1. *m.* 8.]

28 Edw. 1. Pipot, Agnes, who was the wife of Richard, against William de Venables. Dower of a tenement in Routhesthorn. [27, 28 *Edw.* 1. *m.* 2.]

28 Edw. 1. Tabley, "Tableg," William, for detention of dower of 1 water-mill in Clyve, against Alicia, his mother. [27, 28 *Edw.* 1. *m.* 2.]

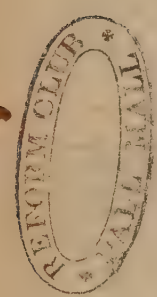
28 Edw. 1. Berthinton, Christiana, who was the wife of Randal de, against Randal, son of Randal de Berthinton. Dower. [27, 28 *Edw.* 1. *m.* 3 *d.*]

28 Edw. 1. Frodsham, Leticia, who was the wife of Henry de, against Walter de Hellesley, son of John le Serjaunt. Dower, 1 messuage in Frodsham ; and against Randal, son of Thomas Gavesone, dower of 1 acre of land in the same town. The said Walter and Randal vouch to warranty Richard, son of Thomas, son of Payn, of Frodsham. [27, 28 *Edw.* 1. *m.* 4, 8 ; 28, 29 *Edw.* 1. *m.* 2, 3, 5.]

28 Edw. 1. Tabley, Alice, who was the wife of William de, against Thomas de Wevere. Dower of 1 water-mill in Clyve. The said Thomas vouches to warranty William, son of the said William de Tabley, his father. [27, 28 *Edw.* 1. *m.* 4, 5.]

28 Edw. 1. Wich Malbank, Margery, who was the wife of Ralph, son of Robert, son of Randal de, against Ralph Bonvallet. Dower of 1 messuage in Wich Malbank. [27, 28 *Edw.* 1. *m.* 5.]

28 Edw. 1. St. Pierre, Urian. Inquisition p.m., finding that the said Urian held, on the day he died, of the lord the King in capite, by the law of England, of the inheritance of Idonea, late his wife, a 4th part of the barony of Malpas, by the service of one knight's fee and a half, yearly value 12*l.* ; also the manor of Anderton of the said King, in free-soccage, by the service of one pound of pepper, yearly value 6*l.* ; also of the King in capite a 6th part of the barony of Schipbrok, by the service of half a knight's fee, yearly value of 6*l.* ; also of the King in capite a moiety of the serjeanty of the peace in the county of Chester, by the law of England of the inheritance of Idonea, his wife, by the service of finding 10 serjeants of the peace in the county aforesaid, yearly value 11*l.* ; also of the King in capite an 18th part of the barony of Wich Malbank, by the service of a moiety of a knight's fee, yearly value 4*l.* ; also of the King in capite, at Torperley and Kellesal, a certain passage at fair time, valuing yearly 17*d.* ; also of Roger de Spurstowe and his parceners, in free-soccage land in Spurstowe and Halghton . . . . by the service of one rose, yearly value 20*s.* ; also of the Lords of Bon . . . in free-soccage . . . . manor of Pecforton, by the service yearly of 2*s.*, yearly value 6*l.* ; also of Hona, son of Eygnon, in free-soccage, a tenth part of the lordships of Rydeleg', Spurstowe, and Halghton, by the service of 8*d.* yearly, yearly value 2 marks ; also in free-soccage, 1 carucate of land in Rydeleg', of the Prior of the Hospital of St. John of Jerusalem in England, by the service of 12*d.* yearly, yearly value 20*s.* ; also of Henry del Beure, in free-soccage, 7 acres of land in Fadelegh, by the service of 1 rose yearly, yearly value 5*s.* ; also of Roger de Wolaston, and David, son of Richard de Bonnebur', 1 mill and half a mill in Horselegh', by the service of 18*d.* yearly, yearly value 2 marks ; also of Robert de Praers, a third part of Cherleton, by the service of 6*d.* yearly, yearly value 10*l.* ; also of the said Robert, 2 salt-pits in Wich Malbank, by the service of 12*d.* yearly, yearly value 30*s.* ; and of Richard de Sutton, in free-soccage, 2 burgages in Malpas and 2 salt-pits in Fulwich by the service of 20*d.* yearly, yearly value 1 mark. [27, 28 *Edw.* 1. *m.* 6.]



28 Edw. 1. Faber, Leuca, who was the wife of Richard Faber, of Wildeleg', against Roderick, son of Griffin, and Katherine, his wife. Dower of 1 messuage and 20 acres of land in Little Egge ; and the said Roderick vouches to warranty Urian de St. Pierre. [27, 28 *Edw.* 1. *m.* 6 *d*, 7.]

28 Edw. 1. Coudrey, Matilda, who was the wife of Richard, against Hugh de Brichull and Mar', his wife. Dower. [27, 28 *Edw.* 1. *m.* 7.]

No. 4.—Welsh Records: Deeds, Inquisitions, &c.—*continued.*

28 Edw. 1. Faber, Leuca, who was the wife of Richard, of Wildelegh, against Roderic, son of Griffin, and Katherine, his wife. Dower of 1 messuage and 20 acres of land in Parva Egge. [27, 28 *Edw.* 1. *m.* 7.]

28 Edw. 1. Berthyngton, Christiana, who was the wife of Randal, son of Randal de Berthington. Dower of 4 messuages, 3 bovates and 5 acres of land in Berthington, near Anderton. The said Randal vouches to warranty Henry, son and heir of Randal de Berthington, a minor. [27, 28 *Edw.* 1. *m.* 8.]

28 Edw. 1. Pipot, Agnes, who was the wife of Richard, against Robert Pipot, whom William de Venables had vouched to warranty. Dower of 30 acres of land in Routhestorn'. [27, 28 *Edw.* 1. *m.* 8, 9, 11, 13.]

28 Edw. 1. Tabelegh, Alice, who was the wife of William de Tabeleg', against Thomas de Wevere. Dower of 1 water mill in Clyve. [27, 28 *Edw.* 1. *m.* 9.]

28 Edw. 1. Clive, Sibilla, who was the wife of Warren de, against Randal, son of Hugh de Merton. Dower of 8 acres of land in Clyve. The said Randal vouches to warranty Henry de Clive, son and heir of the aforesaid Warren. [27, 28 *Edw.* 1. *m.* 10.]

28 Edw. 1. Coudrey, Matilda, who was the wife of Richard de, against Adam de Bacford. Dower of 1 messuage and 2 bovates of land in Lee, near Bacford. [27, 28 *Edw.* 1. *m.* 11.]

—— The same, against David le Wurner. Dower of 4 messuages, 2 bovates of land, and 2 acres of meadow in Newton, near Chester. The jury say that the said Richard de Coudrey was never seised in fee of the said tenement in Neuton. [*Ibid.*]

28 Edw. 1. Wolfhull, Mornilla, who was the wife of Adam de, against William Byle and Felicia, his wife. Dower of 1 messuage in Wolfhull. The said William and Felicia vouch to warranty William, son and heir of Adam de Wolfhull, and exhibit a Charter showing that Richard de Wolfhull enfeoffed Richard, his son, grandfather of the aforesaid William, of all his land in the field called Wolfhull, and in Herteplawe, Redith, and "La Wyteri-"dinge," together with the waste within and without the town of Wolfhull. [27, 28 *Edw.* 1. *m.* 11.]

28 Edw. 1. Ellesmere, Richard de, and Cecilia, his wife, against Alice, who was the wife of Wyon del Halgh. Dower. [27, 28 *Edw.* 1. *m.* 12.]

28 Edw. 1. Barkesford, Avice, who was the wife of Hugh de, against John de Hunsterton, and Richard de Caworthin and Juliana, his wife. Dower of 3 acres of land in Barkesford. [27, 28 *Edw.* 1. *m.* 12, 16.]

28 Edw. 1. Halgh', Alice, who was the wife of Wyon, son of Philip del, against David del Halgh'. Dower of 1 messuage, 20 acres of land, and 5 acres of moor in Malo Passu. [27, 28 *Edw.* 1. *m.* 14, 15 *d.*]

—— The same, against Richard de Ellesmere and Cecilia, his wife. Dower of 20 acres of land and 5 acres of moor in Malo Passu. [*Ibid.*]

28 Edw. 1. Verrur, Margery, who was the wife of Simon le, against Richard, son of Peter le Roter. [27, 28 *Edw.* 1. *m.* 14.]

27 Edw. 1. Wich Malbank, . . Margery, who was the wife of Ralph, son of Robert, son of Clement de, against John, son of Ralph, son of Clement, and Randal Russel. Dower. [27, 28 *Edw.* 1. *m.* 15.]

27 Edw. 1. Wodenot, Matilda, who was the wife of William, against Randal, son of William Wodenot. Dower. [27, 28 *Edw.* 1. *m.* 15.]

29 Edw. 1. Honde, Hawisia, who was the wife of Walter Honde del Kutehurst, against William, son of William de Overe Tabelegh'. Dower of 3 acres of land in Overe Tabelegh'. The said William vouches to warranty Ralph, son of Walter de Kutehurst, in the custody of Hawis', his mother, by Charter of Randal de Kutehurst, his grandfather, whose heir he was, by which Charter the said Randal gave to one Henry de Kutehurst the aforesaid tenement. [28, 29 *Edw.* 1. *m.* 8.]

29 Edw. 1. Hapesford, Alice, who was the wife of Robert de, against Ralph Corbyn and Margery, his wife. Dower of 3 messuages, 6 acres of land, and 2 acres of meadow in Hapesford. [29, 30 *Edw.* 1. *m.* 1 *d.*]

30 Edw. 1. —— The same, against Robert, son of Roger de Elton and Alic', his wife. Dower of 3 messuages, 6 acres of land, and 2 acres of meadow in Happesford. [*Ibid. m.* 2 *d.*]

30 Edw. 1. Treweknane, Margery, who was the wife of Thomas, against John Treweknane. Dower of 2 burgages in Middlewich'. [29, 30 *Edw.* 1. *m.* 2 *d*, 5.]

No. 4.—Welsh Records: Deeds, Inquisitions, &c.—*continued.*

30 Edw. 1. Hokenhull, Cecilia, who was the wife of Robert de, against Thomas, son of Robert de Hokenhull. Dower of 8 messuages, 8 bovates of land, 1 acre of meadow, 20 acres of wood, 4 acres of heath, 10 acres of moor, and 2 parts of a mill in Hokenhull, and of 15 messuages, 14 bovates of land, 16 acres of wood, 100 acres of heath, 15 wears, and 2 parts of 1 water-mill in Shotewyk. [29, 30 *Edw.* 1. *m.* 2 *d.*]

30 Edw. 1. Bradeleg' Overe, Hawisia, who was the wife of John de, against William Gerard. Dower. [29, 30 *Edw.* 1. *m.* 4 *d.*]

30 Edw. 1. Broun, Alicia, who was the wife of Nicholas, against Roger de Lachecote. Dower of a tenement in Calvelegh'. [29, 30 *Edw.* 1. *m.* 8.]

30 Edw. 1. Foxlegh', Cecilia, who was the wife of Peter, son of William de, against William de Foxlegh, of Lymme. Dower of 1 toft and 5 acres of land in Lymme; and against Richard, son of William de Foxleg', dower of 3 acres of land in the same town. [29, 30 *Edw.* 1. *m.* 8, 12, 14.]

30 Edw. 1. Hallum, Eva, who was the wife of William de, against William de Hallum. Dower of 9 acres of land in Neuton, near Deresbur'. The said William vouches to warranty Thomas de Hallum. [29, 30 *Edw.* 1. *m.* 10, 13 *d*, 16 *d.*]

30 Edw. 1. Ryrith, Ellen, de Burton, late wife of Adam de Ryrith, and Adam de Burton, her husband, in consideration of dower being assigned to the said Ellen of the manor of Little Baruse, by Robert de Hemington, who held the same manor by a grant of Richard de, to the said Robert and his heirs for ever, quitclaim all right they had in the name of dower to certain land near the well called "Seint Pleymondes Well" and elsewhere in the said manor. [29, 30 *Edw.* 1. *m.* 10 *d.*]

30 Edw. 1. Huxlegh, Agnes, who was the wife of Richard, son of William, against John, son of Richard, son of William de Huxlegh, and Robert, son of Agn' de Huxlegh. Dower of land in Huxl' and Burton. [29, 30 *Edw.* 1. 12.]

30 Edw. 1. Stanlegh, Agnes, who was the wife of Simon de, against Richard Wodenot. Dower of 4 acres of land in Stanlegh. [29, 30 *Edw.* 1. *m.* 13 *d.*]

30 Edw. 1. Mascy, Alicia, who was the wife of Richard de, against Hamond de Mascy, guardian of the land and heir of Richard de Mascy, of Pudington. Dower of 17 messuages, 20½ bovates of land, 12 acres of land, 2 acres of meadow, 20 acres of wood, and 40 acres of moor and heath; and against William de Mascy of Podington, dower of 4 messuages, 4 bovates of land, and 13½ acres of land. [29, 30 *Edw.* 1. *m.* 15, 16.]

30 Edw. 1. Walton, John, son of Alexander de, and Alice, his wife, against Randal, son of Randal de Starkey. Dower. [29, 30 *Edw.* 1. *m.* 15.]

30 Edw. 1. Byrches, Matilda, who was the wife of Hugh de, against John, son of Hugh de Birches. [29, 30 *Edw.* 1. *m.* 15.]

30 Edw. 1. Huntingdon, Robert de, and Christiana, his wife, against Philip, son of William de Golburne. Dower. [29, 30 *Edw.* 1. *m.* 15.]

30 Edw. 1. Wodechurche, Sigritha, who was the wife of Roger, son of Norman de, against Alice, daughter of the said Norman, and Emma and Alicia, her sisters. Dower of 2 parts of 1 messuage and 2 bovates of land in Wodechurche. [29, 30 *Edw.* 1. *m.* 16 *d.*]

33 Edw. 1. Chester, Abbot and Convent. Inquisition taken before W. Trussel, Justice of Chester, on a writ of "Ad quod damnum," as to whether the Earl of Chester could give licence for the following grants to be made to the aforesaid Abbot and Convent, viz., from Richard de Mascy, Kt., 1 messuage and 4 bovates of land in Chorlton; from Richard de Morston, 1 messuage and 4 bovates of land in the town of Morston; from Adam de Bacford, 1 messuage and 2 bovates of land in "La Lee," near Backford; and from Henry Parson, of the Church of Tatenhale, 1 messuage and 1 bovate of land in Lauton, near Lym'; finds that, with the exception of that of Richard de Mascy, Kt., the said grants may be made, inasmuch as Hugh de Lou, formerly Earl of Chester, gave the same tenements to the Church of St. Werburgh at its foundation, and the predecessors of the then Abbot enfeoffed certain persons of the same tenements to be held of the said Abbot and Convent by certain yearly services. Nothing was said as to the grant of Richard de Mascy, Kt., as he died before the taking of the Inquisition. [32, 33 *Edw.* 1. *m.* 1.]

33 Edw. 1. Byrcheved', Prior and Convent. Inquisition taken upon a writ "Ad quod damnum," finding that the said Prior and Convent might, without damage to the Earl of Chester, &c., inclose 30 acres near to their grange in the Forest of Wyrhale. [32, 33 *Edw.* 1. *m.* 1 *d.*]

No. 4.—Welsh Records : Deeds, Inquisitions, &c.—*continued.*

32 Edw. 1. Mariot, William son of, of Wich Malbank, and Margery, his wife. Charter of, granting all their land and tenements in Wich Malbank to William, their eldest son. [32, 33 *Edw.* 1. *m.* 1 *d.*]

33 Edw. 1. Tervyn, Sibilla, who was the wife of Philip de, against William de Duyn. Dower of 3 messuages and 6 acres of land in Onsecroft and Tervyn. The said William vouches to warranty Margery, daughter of the said Philip. [32, 33 *Edw.* 1. *m.* 2, 4.]

33 Edw. 1. Meyluyr, Ellen, who was the wife of Robert, against Roger, son of Thomas de Macclesfield. Dower of 2 bovates of land in Stanelegh. [32, 33 *Edw.* 1. *m.* 2, 4.]

33 Edw. 1. Bostock, Amicia, who was the wife of William de, against John de Arcled. Dower. [32, 33 *Edw.* 1. *m.* 2.]

33 Edw. 1. Littele, Alicia, who was the wife of Richard le, of Wygelond, against William, son of John, son of Ken', Richard, son of Ralph de Pulford, and Alice, his wife. Dower of a tenement in Bykerton. [32, 33 *Edw.* 1. *m.* 2.]

33 Edw. 1. Spurstowe, Alicia, who was the wife of John de, against William, son of William de Spurstowe. Dower of 1 messuage and 4 acres of land in Spurstowe. [32, 33 *Edw.* 1. *m.* 6 *d*; 33, 34 *Edw.* 1. *m.* 1.]

33 Edw. 1. Elleworthe, Mabilla, who was the wife of Reginald de, against Robert de Swetenham. Dower of 1 salt-pit in Middlewich.

33 Edw. 1. Potter, Hawisia, who was the wife of Richard le, against Philip del Brugge. Dower of a tenement in Frodesham. [33, 34 *Edw.* 1. *m.* 1.]

33 Edw. 1. Sygertha, who was the wife of Nicholas, son of Mary, against Richard de Ravenescroft. Dower of 1 messuage and 1 curtilage in Middlewich. [33, 34 *Edw.* 1. *m.* 1, 3 *d*, 14.]

33 Edw. 1. Monte Alto, Robert de. Inquisition taken on a writ "Ad quod damnum," as to whether licence could be given to the said Robert to cut down and assart the wood called "Tropwod," in his manor of Boslee, situated within the Forest of Macclesfield, finding that should the Earl of Chester grant to the said Robert to assart his said wood, it would be to the damage of the Earl and his tenants of Sutton Fernylegh and Donnes, having common of pasture in the soil of the said wood, to the value of half a mark yearly; that the aforesaid wood was within the manor of Boslee, which, together with the manor of Hawardyn, was held of the Earl of Chester by homage and by the stewardship of placing the first dish before the Earl whenever he should be at Chester at Christmas; and that the said wood contained 40 acres of land, every acre valuing 5*d.* yearly. [33, 34 *Edw.* 1. *m.* 2 *d.*]

33 Edw. 1. Balledanter, William, and Isabel, his wife. Charter of, granting to Robert Balledanter, their son, 2 messuages and 2 bovates of land in Pulton . . . which John Redhoc before held of the said William and Isabel, the said Robert to pay to William Lancelin, Lord of Pulton, 6*d.* yearly. [33, 34 *Edw.* 1. *m.* 2 *d.*]

34 Edw. 1. Muskerel, Robert. Charter of, granting all his messuages and land in Wylaston to Leticia, his daughter, to hold to the said Leticia in as full a manner as the said Robert held the same under a Charter from Richard Muskerel, his father. [33, 34 *Edw.* 1. *m.* 4 *d.*]

34 Edw. 1. Whythenschagh, William de, and Sibilla, his wife. Charter of, granting to Henry, son of Gilbert de Brerton, 2 acres of land, 2 parts of 1 acre, and 2 parts of 1 piece of meadow in Brereton, near to Hetcroft, and Sindersych' in le Stockes. [33, 34 *Edw.* 1. *m.* 11 *d.*]

34 Edw. 1. Spurstowe, Alice, who was the wife of John, son of William, against William de Spurstowe, senior. Dower of 1 messuage and 1 carucate of land in Spurstowe. [33, 34 *Edw.* 1. *m.* 11 *d*, 17.]

34 Edw. 1. Fadil', Editha, who was the wife of Henry de, against William, son of Henry de Fadil'. Dower of 1 messuage and 16 acres of land in Fadyl'. [33, 34 *Edw.* 1. *m.* 14, 17 *d*, 22.]

34 Edw. 1. Griffyn, Geoffrey, son of Geoffrey. Charter of, releasing William de Praers, his heirs and assigns, from payment of rent for the lands he held of the said Geoffrey in Weston, near Bertomleg'. [33, 34 *Edw.* 1. *m.* 21.]

34 Edw. 1. Hawnselyn, Matilda, daughter of Ralph de, of Guldenesutton'. Charter of, granting all her lands and tenements in Guldenesutton, together with a messuage in the town of Guldenesutton, to Isabel, her sister. [33, 34 *Edw.* 1. *m.* 21.]

34 Edw. 1. Wich Malbank, Ameria, who was the wife of John, son of Ralph de, against Adam, son of Adam de Wetenale. Dower of 2 messuages and 1 garden in Wich Malbank. The said Adam vouches to warranty Robert, son of Ralph. [33, 34 *Edw.* 1. *m.* 21 *d.*]

No. 4.—Welsh Records: Deeds, Inquisitions, &c.—*continued.*

34 Edw. 1. Knysty, Cecilia, who was the wife of Adam de, against Richard le Harper. Dower of 9 acres of land in Neuton, near Preston. The said Richard vouches to warranty Peter de Dutton. [33, 34 *Edw.* 1. *m.* 21 *d.*; 35 *Edw.* 1. *m.* 6.]

—— The same, against Robert de Caldewelle. Dower of 1 messuage and 2 parts of 2 bovates of land in Neuton, near Preston. The said Robert vouches to warranty Robert le Mascy of Sale. [*Ibid.*]

35 Edw. 1. Alsacher, Bertreda, who was the wife of Randal de, against Richard son of Randal, son of Adam de Alsacher. Dower. [35 *Edw.* 1. *m.* 1.]

35 Edw. 1. Wordhulle, Maltilda, who was the wife of Hugh de, against William Coly, of Bonebur'. Dower of 2 messuages and 8 acres of land in Wordhull. The said William vouches to warranty William, son of William de Wordhulle. [35 *Edw.* 1. *m.* 1.]

35 Edw. 1. Dudefyn, Richard. Inquisition taken on a writ "Ad quod damnum," whether licence could be given to the said Richard without damage, &c., to grant 16 acres of land in Stanthurll and Clyve to the Abbot and Convent of Vale Royal, &c., finding that the said Richard held the said 16 acres of Gilbert Dudefyn by the yearly service of one penny and one pair of gloves; that the same Gilbert held the manor of Stanthurlle of Richard de Bradewelle, who held it of Peter de Thornton, who held it of Hugh de Venables, who held it immediately of the Earl of Chester; that such grant would be to the damage of the Earl only should an escheat happen thereof by the death of the intermediate tenants, and the said Earl should in any manner be precluded from entering upon the said land as an escheat; the same with respect to the rights of the said Gilbert, and that the land was of the yearly value of 16*s.* [35 *Edw.* 1. *m.* 3.]

35 Edw. 1. Harecourt, Agnes, who was the wife of Robert de, against Richard de Fouleshurst. Dower of 1 messuage, 5½ acres of land, and 1½ acre of meadow; and against Thomas, son of Robert de Harecourt, dower of 5 messuages, 50 acres of land, 1 rood of meadow, and 2 acres of brush in Werleston and Cherlegh. [35 *Edw.* 1. *m.* 4.]

35 Edw. 1. Grosvenor, Warinus le. Inquisition p.m., finding that the said Warin held in Buddeworth of the Earl of Chester, by fealty and homage, 1 capital messuage, 2 carucates of land, and 3 acres of meadow, of the yearly value of 4*l.*, 2 mills of the yearly value of 40*s.*, a free rent of 2*d.*, and rents terminable of the yearly value of 4*l.* . . . *d.*, also a forestry in the Forest of Mara of the yearly value of 6*s.*, also of Robert le Brun, by fealty, in the city . . . . 9*d.* annual rent, and that Warin, his son, was his heir. [35 *Edw.* 1. *m.* 5.]

35 Edw. 1. Thorneton, Hugh de. Inquisition p.m., finding that the said Hugh held, on the day he died, of the Earl of Chester in capite, the manor of Thorneton Maheu, and a moiety of the town of Pulton' Waley, by the service of a 4th part of a knight's fee, yearly value 7*l.* 7*s.* 4*d.*, also 1 burgage in the city of Chester, in free hostelage, yearly value half a mark; also of William Launcelyn, in capite, 1 carucate of land in Pultone Launcelyn, yearly value 20*s.*, and that Roger, son of the said Hugh, was the next heir, and of the age of 21. [35 *Edw.* 1. *m.* 5.]

35 Edw. 1. Harecourt, Agnes, who was the wife of Robert de, against Robert, son of Robert de. Dower of 43½ messuages, 16½ bovates of land, 247 acres of land, 20 acres of meadow, 112 acres of wood, 20 acres of heath, 7 acres of brush, 15½*d.* rent, 1 water mill, and a 4th part of a water mill in Chorlegh, near Wrennebur', Worleston, and Barkeford. Against John de Worleston, dower of 4 messuages, 80 acres of land, 6 acres of meadow 3 acres of moor, 30 acres of wood, 12 acres of brush . . . . . and of a moiety of a water mill in Worleston; against Patrick de Cruwe, dower of . . . messuage and a half, 1½ bovate of land, 30 acres of land, 2 acres of meadow, 12 acres of wood, 8 acres of brush . . . . . ½*d.* rent, and of a 4th part of 1 water mill in Worleston; against William Wodenot and Isabel, his wife, dower of 14 acres of land in Barkesford; against Richard de Fouleshurst, dower of 1 messuage, 5 acres of land, 1 acre of meadow . . . . . in Worleston; against Thomas, son of Thomas de Harecourd, dower of 5 messuages, 50 acres of land, 1 rood of meadow, 2 acres of brush in Chorlegh'. The said John, Patrick, Richard, and Isabel, his wife, and Thomas, vouch to warranty Robert, son of R . . . de Harecourd. [35 *Edw.* 1. *m.* 6.]

No. 4.—Welsh Records: Deeds, Inquisitions, &c.—*continued.*

35 Edw. 1. Mulneword, Clarice, who was the wife of Robert le, against Henry le Fleshewer. Dower of 2½ acres of land in Claverton. The said Henry vouches to warranty Richard, son of Robert Molendinarius. [35 *Edw.* 1. *m.* 6 *d*, 8.]

35 Edw. 1. Wordull, Matilda, who was the wife of Hugh de, against William, son of William de Wordull. Dower of 3 messuages, 80 acres of land, and 40 acres of wood in Wordull. Against Isabel, who was the wife of William de Wordull, dower of 3 messuages, 20 acres of land, and 20 acres of wood in the same town. Against Hugh de Calvylegh, dower of 4 acres of land in the same town. Against William, son of Roger, dower of 1 messuage and 3 roods of land in the same town. Against Richard, son of Roger, dower of 6 acres of land in the same town. [35 *Edw.* 1. *m.* 9.]

35 Edw. 1. Pulesdon, Richard, son of Richard de, Knight, grant to, by the Earl of Chester, of Batebrugge Moor, in the hundred of Overton. [35 *Edw.* 1. *m.* 10.]

35 Edw. 1. Boydel, William, Lord of Hanle. Inquisition taken on a writ of "Ad quod damnum," whether the Earl of Chester could, without damage, &c., grant to the said William to hold a market in the town of Hanle every Thursday, and a fair every year at the Feast of the Ascension, and to have warren throughout his demesne land of the manor of Hanle, finding that it would not be to the damage, &c., for the said William to hold the said market, as there was no other market nearer to the town of Hanle than that of the city of Chester, 3 leagues "leucas" or more distant; neither would it be to the damage, &c., for him to hold the said fair or to have the said warren. [35 *Edw.* 1. *m.* 3 *d.*]

35 Edw. 1. Doncastre, William. Inquisition taken on a writ of "Certiorari," as to the extent and value of the manor of Moston, and whether it would be to the damage of the Earl of Chester to grant the reversion of the said manor, on the death of James de Sancto Georgio, who held the same for life by a grant of Edw. 1., to the said William, finding that there was no capital messuage on the said manor, but a toft where the capital messuage was wont to be; that there were 60 acres of wood, each acre of the yearly value of 6*d.*; 6 carucates of demesne lands, each carucate of the yearly value of 30*s.*; a water mill, of the yearly value of 4*l.*; turbary, of the yearly value of half a mark; and the pleas and perquisites of the Court, together with stallage of the yearly value of 13*s.* 4*d.*; and that it would not be to the damage, &c., of the said Earl to grant the said manor to the said William. [35 *Edw.* 1. *m.* 3 *d.*]

35 Edw. 1. Walle, William, son of William del, and Margery, his wife, against John, son of Robert Daa, and Beatrice, his wife. Dower. [35 *Edw.* 1. *m.* 4 *d.*]

Prepared and examined by
(Signed) PETER TURNER.

No. 5.—Chronological List of Documents, prepared by Mr. Sanders, forming Part I. of the Book of Fac-similes of National Manuscripts, in process of being taken by Photo-zincography.

William the Conqueror to Henry VII.

William the Conqueror.

I. Charter granted by the King to the City of London. Written in Saxon and confirming the laws of Edward the Confessor; it may possibly have been granted at the instance of the Bishop of London, who was the King's Chaplain and is said to have obtained many privileges for that City.

II. A grant of land in Gyddesdune [? Ingatestone], Co. Essex, to Deorman; also in Saxon. Deorman was a vassal of the Conqueror, and by his name a Saxon, and the King speaks of his having been unjustly deprived of the property restored to him by this grant, but his name does not appear in Domesday Book among the persons holding land in England previous to the Conquest, nor indeed among any of the tenants before or after in Essex. He is probably identical with "Derman of London," one of the King's tenants-in-chief in Middlesex, and Derman, the King's Thane, a like tenant in Hertfordshire.

III. Extracts from pp. 56 a and 62 a of Domesday Book. These extracts were chosen on account of their relation to Windsor Castle, the great palace of English Kings, and they derive additional interest from the fact of the name of one of the most illustrious among the many illustrious princes who have inhabited it, Albert, being that of the first tenant of the manor mentioned.

William Rufus.

IV. Charter granted by the King to St. Andrew's, Rochester. This charter, which appears to have been granted in 1088, in amends for the injuries the church had suffered during the siege of the City of Rochester, when, under the command of Odo, Bishop of Bayeux, and Eustace, Earl of Boulogne, it held out against the King, in favour of his brother Robert, grants, among other things, the church and vill of Lambeth as freely as ever the Countess Goda held the same. The Countess Goda, sister of Edward the Confessor, is mentioned in Domesday Book as having held Lambeth previous to the survey.

Henry I.

V. Charter granted to the Convent of Wikes by the King. It commences by confirming the institution of the said house by Walter and Alexander Mascherel, at the prayer of their sister Edith, "for the welfare of their souls and healing of their sins," and the grant made by them of certain lands and rents to the same. Its date is probably about 1130, at Westminster.

VI. Charter granted by the King to Holy Trinity, London. This charter, among other things, grants the soc of "Cnichtengild" [a guild of nineteen knights, founded by King Edgar, who is said by Stow to have given them a piece of vacant land without the City walls, now called Portsoken Ward]. Its date appears to be between 1116 and 1120, at Northampton.

VII. Charter granted by the King to Christchurch, London. Dated at Westminster.

Stephen.

VIII. Charter granted by the King to Holy Trinity, London, confirming the previous one of King Henry. Dated at Westminster.

IX. Charter granted by Eustace, Earl of Boulogne, King Stephen's eldest son, to Holy Trinity, London, at the prayer of his mother, Queen Matilda, and by concession of the King, his father, for the welfare of their souls and those of his sister Maud and his brother Baldwin, "who lie buried within the said church." Dated at St. Alban's.

X. Charter granted by the Empress Maud to Christchurch, London, under the style and title of "Maud the Empress, daughter of King Henry and Lady of the English." Witnessed by Robert, Earl of Gloucester, the Empress' natural half-brother and staunch supporter in her struggle for the English Crown.

Henry II.

XI. Charter granted by the King to the Convent of Wikes. It confirms the Mascherel's grant, and concedes very full privileges. Among others, the nuns are to have two greyhounds and four braches, dogs hunting by scent, to take hares; their hounds are to be free from lawing, and their vassals from wood-waste and deer-ward; and they are to have free ingress and egress into and out of the Royal forest, to fetch and carry "whatever God shall award them." Thomas Becket, the Chancellor, is one of the seven attesting witnesses. Dated at Northampton between the years 1157 and 1162.

No. 5.—Chronological List of Documents, &c.—*continued.*

XII. Grant by the King to Holy Trinity, London, confirming that made to the said church by Henry I. of 25*l.* a year out of the rents of the City of Exeter. Queen Eleanor and Thomas Becket are among the attesting witnesses. Dated at London.

RICHARD I.

XIII. Charter granted by the King to the Convent of Wikes. Given under the hand of William de Longchamp, Bishop Elect of Ely and Chancellor, at Canterbury, the 28th November 1189.

Extracts from Pipe Roll, 2 Richard I.

XIV. The portions of this Roll chosen as specimens are the membrane relating to the counties of Southampton, Buckingham, and Bedford, and part of another membrane setting out the purchase of the ships taken up to convey the King and his army to the Holy Land, and the rate of pay given to the pilots and sailors in charge of the same. The first contains some curious items connected with the Crusade, such as the purchase of 800 hogs and 10,000 horse-shoes; the expenses of the "Royal yacht"—the King's "Esnecca"—a word which occurs frequently in the Pipe Rolls, and from which the term "smack" is perhaps derived, "when the Queen and the French King's sister, the Countess "of Albemarle, Philip de Columbers and other of the King's lieges, crossed over with "the treasure;" of three other ships to carry their baggage and retinue; and of three more for William of St. Mary Church and the Abbot of Reading, in charge of the treasure and the King's Chancery. Also the pay of Alan Cleave-the-Sea, for piloting the Esnecca from Southampton to Shorcham. There are also several entries concerning the New Forest, one of which is the payment of one mark "de sale Buttorum," the meaning of which is obscure. There was formerly a great quantity of salt made at Lymington and other places on the coast, and the old tracks made by the salt carts used for carrying it across the Forest still exist in the form of deep ruts, now hidden by gorse and heather, with here and there an old station or resting-place; but there appears to be no connection between the salt and the word "Butts," though Mr. Cumberbatch, of the "King's House," at Lyndhurst, has kindly given all the information on the subject which his knowledge of the Forest, as Ranger, suggested. There are Butts still existing in name at Brockenhurst and elsewhere, but they have always been thought to be shooting butts, and there is no difficulty in giving that meaning to the second mention of the word, which occurs shortly after the first, unaccompanied by any allusion to salt. Entries of monies owed by Jews appear in three or four places, and the responsibility of townships and tithings for the conduct of individual members is also illustrated. In the separate accounts for the City of Winchester are monies paid to the "sick persons on "the hill," to "Geldewin, the recluse of S. Ædred, without the vineyard," and "Nicholas, "the gatekeeper," is described as the recipient of an alms, "quæ fuit Sarraceni."

The nurse of William, the Duke's son, has two marks given her by the King, and there is a charge for carrying 17 hostages to Porchester and Hampton. In Buckinghamshire is frequent mention of rents being paid in hawks, of which as many as 29 were due at one time from one man. A hundred pounds was paid by Simon de Beauchamp for the custody of Bedford Castle. The Barons of Bedfordshire render their accounts of 200*l.* for deafforesting that part of their county which King Henry I. had afforested, of which sum they had only paid 53*l.* 16*s.*; and Bertram de Verdun pleads payment of 100 marks to the King in Normandy, as part solution of monies due from him for the equipment of two parts of two ships which belonged to William de Stuteville.

XV. The second extract from the same Pipe Roll consists principally of the accounts of monies expended in the purchase of ships and pay of their crews, by which it appears that the mean cost of each ship was 36*l.* 0*s.* 6*d.*, while the pay of the men was fixed at 3*l.* 0*s.* 10*d.* per man, and that of the pilots at 6*l.* 1*s.* 8*d.* each, for the year. The ship purchased from Walter, the boatswain's son, is the most expensive; those furnished by Southampton and Shoreham come next; and those found by the Cinq Ports, which form the bulk, are the cheapest. The crews seem to have been tolerably equal in point of numbers, except in the case of the King's "esnecca," where they were treble any of the others.

XVI. The Lincoln copy of Magna Carta.

XVII. Extract from Charter Roll, 17 John. This extract, which is written in Norman-French, is an enrolment of Letters Patent by Stephen Langton, Archbishop of Canterbury, relative to the King's grant, made to him in the previous year, of the patronage of the see of Rochester, to put a stop to the squabbles between the monks of that Church and the Archbishops of Canterbury in their respective claims to the right of electing on the occurrence of a vacancy. Pandulph, the Pope's Legate, is one of the attesting witnesses. Dated at Winchester, on the 20th of January, in "the first year of "the relaxation of the General Interdict of England."

No. 5.—Chronological List of Documents, &c.—*continued.*

Henry III.

XVIII. Grant of a yearly sum of 25*l.* 12*s.* 6*d.* to Holy Trinity, London, by Richard, Earl of Cornwall, the King's brother; dated at Hinlegh, February 16, 1256.

XIX. Extract from Patent Roll, 42 Henry III. This extract, which is the earliest specimen of English known on the Rolls, is styled in the margin "Carta in idiomate "Anglico missa ad singulos comitatus Angliæ," and is the enrolment of a Writ Patent addressed to the men of Huntingdonshire, charging and exhorting them to keep and observe the statutes made by the King's Redesmen or Councillors "in the worthnesse "of Gode and ov ure treowthe for the freme of the loande." Dated at "Lunden thane "egtetenthe day ov the month of Octobre in the two and fowertigthe yeare of ure "cruninge." This writ is also ordered to be sent into Ireland.

XX. Extract from Close Roll, 49 Hen. III. This extract marks an important epoch in English History, being the enrolment of the writs issued in the King's name by Simon de Montfort, for the summons of the first Parliament, to which Knights of the Shire and representatives of Cities, Boroughs, and the Cinq Ports were called. Dated at Worcester on the 14th of December, and at Woodstock on the 24th of December.

Edward I.

XXI. The original Letters Patent by Florence, Count of Holland, Robert the Bruce, John Balliol, John de Hastings, John Comyn, Patrick Dunbar, John de Vesey acting for his father, Nicholas de Soules, and William de Ros, the rival claimants of the Scottish Crown, granting seisin of all the land and castles of Scotland to Edward I., whom they had appointed arbitrator, until he had given judgment on their respective claims, on condition of his giving security for the safe reversion of the same to the successful candidate within two months after the question had been decided. Dated at Norham, Wednesday after the Ascension, 1291. The seals pendant to this instrument, being in fine preservation, are given in the fac-simile in the same tint as the original wax.

XXII. Extract from the Ragman Roll, containing the homage and oath of allegiance made and sworn by the Scotch to Edward I. in 1296. These are the words of the oath: "I will be faithful and loyal and bear myself faithfully and loyally to King Edward, "King of England, and his heirs, with life, limb, and earthly honour, against all men "living or dying, and I will never carry arms for any man, or ever give aid or counsel "against him or against his heirs in any case whatever, So help me God and the "Saints."

XXIII. Extract from the same Roll, being the attesting clause to the truth of the contents and the fidelity of the MS. by "Andrew, formerly clerk of William de Tang, of the "Diocese of York, by authority of the Holy Apostolic See Notary Public," who was present at the ceremony, and made this report of the proceedings with his own hand, "word for word, nothing adding or abating which might change the sense or corrupt "the meaning," with the exception of a few trifling errors which he notes.

XXIV. Extract from a Roll of letters written by Edward, the first Prince of Wales. This curious Roll appears to have been kept by the Prince's Secretary as a duplicate copy of all letters despatched by his Highness, and furnishes proof of the extent of the Prince's correspondence and the method by which it was distinguished. It is for one year only—1304—yet it contains the copies of above 700 letters on all sorts of subjects, political, financial, and domestic, from the one with which the Roll commences, to Adam the Poleter of Reading, commanding him to lodge four tuns of good wine in the Abbey of Reading against the arrival of the Prince's servants at the tournament about to be held there, to that to Pope Clement V. relative to his projected marriage with the Princess Isabella of France. The letter immediately preceding this is one of credence to the Pope in favour of the Prince's two Secretaries, Sir John de Bankewell, Knight, and William de Bliburgh, his Chancellor, whom he dispatches to his Holiness with private intelligence, possibly connected with the same subject. It is written in Latin, and in a singularly inflated and pedantic style, which can hardly have emanated from the Prince himself. Among the fac-similes of those selected for illustrating this record of the feelings and pursuits of the first Prince of Wales, are two, in one of which he entreats the Queen and in the other the Countess of Holland, his sister, to intercede with the King for the admission of Perot de Gavaston among his attendants. Prince Edward was 20 years old at the time, and this is perhaps the earliest mention of that unhappy intimacy which dishonoured his reign and had such fatal consequences for himself and his favourite. Two others are in favour of Ladalli, a Castilian money lender, who had the King's jewels in pawn, and one to the Mayor and Sheriffs of London in favour of the Lady Mortemer du Chastel Richard, who seems to have been imprisoned and very harshly treated by the civic authorities on the bare word of her accusers. To Sir John de Bretagne he writes that he had recommended Henriot de St. Oweyn to the King his father, but as the King has sent word back that he is to meddle with nothing, he dares not do anything further for him. From various entries on this Roll, the Prince

No. 5.—Chronological List of Documents, &c.—*continued.*

of Wales appears to have been at the time in disgrace with the King, although in a letter to the Earl of Gloucester he assures him that the extent of the King's displeasure has been much exaggerated. Appended to this letter is a note in Latin by the Prince's Secretary, to the effect that "my Lord" thanks the Countess of Gloucester for having given up her property for his use, and also for having lent him her seal, which he returns by the hands of Ingelard de Warle, to whom it was delivered, enclosed under the Prince's own seal, on the 21st of July in the Archbishop's chamber, at Lambeth. The Secretary adds that the Countess' seal was at first about to be returned in an open enclosure, but that the Lord Chancellor immediately sealed it up with "my Lord's." One or two instances are given of the Prince's fondness for sporting, and the concluding fac-simile is that of a letter to Sir Hugh le Despenser acknowledging a present of grapes which reached him just as he was going to breakfast, and which he assures the sender could not have arrived at a more opportune moment. The great majority of the letters are in Norman-French.

XXV. Writ of Privy Seal by the King to Sir Aymer de Valence, commanding the Royal forces in Scotland, ordering him to take signal vengeance upon Sir Michael de Wymes, in whom the King has found "neither good word or good deed," and upon Sir Gilbert de la Haye, who is to be even worse treated than Sir Michael, "if worse be possible," in return for his treacherous requital of the courtesy the King had shown to him when in London. Dated at Markeyatt, June 19, 1306.

XXVI. A Jewish "Starra" or deed of covenant. Written in Hebrew.

Edward II.

XXVII. Writ of Privy Seal by the King to Sir Aymer de Valence, Earl of Pembroke, telling him that in consequence of the representation of his Officers in Scotland he has resolved to take the field in person, fearing lest he should lose the country, which his father conquered, by any laches of his own. The Earl is to meet him at Berwick with all the force he can muster on the day of the Nativity of Our Lady, Tuesday, September 8. Dated Westminster, June 16, 1310.

Edward III.

XXVIII. A Letter obligatory, whereby the "Black Prince" binds himself to pay to Sir John de Greilly the "Captal de Buch," Etienne d'Aeqs, Menauton de Casans, Arnaud Guillaume de Puy Lovant, Ramon Aironstanh, Arnaud du Puy, and Pierre de Casans, 25,000 old golden crowns, ransom money of Jaques de Bourbon, Count of Ponthieu, who had been taken prisoner by them at the Battle of Poitiers. Dated at Bordeaux, February 12, 1357. The seal attached is a fine specimen of engraving, and is given with the fac-simile.

XXIX. Writ of Privy Seal by the "Black Prince" for the grant of a pension to John de Esquet. Dated at Angoulême, April 25, 1371. This document is principally valuable as bearing the only known autograph of the "Black Prince," who signs himself not by name, but by his two mottoes, "Homout, Ich dene."

Richard II.

XXX. Letter missive from the King to Michael de la Pole, Earl of Suffolk, his Chancellor, for a yearly grant of a tun of red Gascon wine to Elizabeth, Prioress of St. Magdalene near Bristol. Dated Bristol Castle, July 26. The dates of de la Pole's advancement to the Earldom of Suffolk and his reception of the Seals supply the year 1386. This instrument is remarkable from the extreme rarity of the King's autograph, which it bears.

XXXI. Holograph letter from Lord Chancellor le Scrope to Sir Edmund de Stonore, begging him to let his house in London, in which Sir William Mulso had been lately living, to his kinsman Sir Henry le Scrope, until the house which he has bought in London can be got ready for him. Written in London, January 14.

XXXII. Letter from the Earl of Northumberland to the Lords of the Council upon the perilous state of the Scottish Marches, which are so disturbed that the Warden of Lochmaban Castle has refused to stay in it any longer on any consideration; and the Earl has consequently entrusted the care of it to a squire of Cumberland named Amaund de Mounceux. The Earl wishes to be told what to do about Berwick, which is under apprehension of a raid by the Earl of the Scotch Marches [Dunbar], whom he represents, together with the Earl of Douglas and his cousin Sir Archibald, as robbing and reiving all over the country. Dated at Warkworth, April 2, probably about 1378.

No. 5.—Chronological List of Documents, &c.—*continued.*

Henry IV.

XXXIII. Petition to the King from Simon de Marcheford, Canon of Windsor, for restitution of a right of way through a garden belonging to the college of which he has been deprived. The King grants it in his own handwriting. "H. R. avoms grante "pour ly."

XXXIV. Petition to the King from his humble Esquires, Nicholas Alderwyche and others, for the arrears of pensions due to them. Also granted in the King's own hand.

XXXV. Letter from the Prince of Wales to Sir Richard de Clifford in favour of the bearer and asking news, which the Prince suggests that Clifford has either been too busy or too careless to send him, as to the march of the army into Scotland and other points connected with the tranquillity of the country, which the Prince describes as in a very turbulent state. He also begs for intelligence from France, and concerning the despatch of his messengers. Dated Semar, January 7.

XXXVI. Holograph letter from the Prince of Wales to the King. He forwards a muster roll of his "Brother of Bedford's" and other captain's companies, and rejoices greatly at the "gracieux tydyngs" which the King has sent him, and, with God's grace, he will send all the ladies, as he has been commanded, but before doing so beseeches the King to let him know whether the Duchess of York "shuld be barbid or not." The King's great ship, the Grace Dieu, is ready for sea, "and is the fairest that ever man "saugh I trowe in good feith." And the King of Scots he represents as being "as "glad as any man can be" at the prospect of his visit to the King affording him an opportunity of showing his good will. Dated at Hampton [Southampton], May 14.

XXXVII. A second holograph letter from the Prince of Wales to the King, full of congratulations on the "blissid sacrament of mariage," about to be concluded between the King and Joan of Navarre, and regrets at his inability to be present at the ceremony. He beseeches the King to remember "wyht what conclusion of reste" he had left the Royal presence, and "trusts to Godde" that his cousin Chaucer has informed the King how he has demeaned himself since his return into England. The Prince also states that when he "was on the grette see," he made a "wowe that aftir time I were onys "in youre reaume of England I sholde no see passe, save on pilgrimage, un to I hadde "be at Seint Jamys, and for that cause whanne I was at youre toune of Calays, for "the grete desir I hadde to see the prosperite of youre most dredde and noble persone, "I wentte streht fro thennys to youre most gracious presence, for if I hadde goone "into youre reaume of Engeland I myhte not have come in to Normandie to my "pilgrimage hadde be doo." Dated at Waltham, June 6 [1402]. This and the preceding are the only specimens of Prince Henry's writing known to exist at present, and are the more valuable from the fact of there being none at all after he became King.

Henry V.

XXXVIII. Writ and inquisition upon a "Proof of Age," taken at Honiton on All Hallow's Eve, 1413, to determine the age of William, grandson and heir of Sir William Bonevile, Knight. Among other curious information which this Record affords, is a specimen of English language uttered by a fool in the following sarcastic couplet to Lady Katherine Wyke while riding on her way to the baptism of her nephew, the heir in question:—"Kate, Kate, thereto by myn pate comystow to late."

Henry VI.

XXXIX. Petition by the King's late soldiers in Calais to the Lords of the Council, for payment of wages and restitution of property. Their prayer is granted, and the document bears the signature of Cardinal Beaufort. The date of this petition is not stated, but is probably about 1436, in which year Calais was besieged by the Duke of Burgundy.

XL. Letter from the Duke of Bourbon to the King. Writing in an abject style of submission, the Duke recommends that the utmost caution be observed to keep the understanding between him and the King a secret, lest the garrisons of his strong places should turn against him. In order, therefore, to avert suspicion, he has written to his wife and subjects, to the effect that he is treating with the King on matters of finance, and he offers the King towns, castles, wordly possessions, child, everything that God has given him, to be his good Lord, for after God's grace, he asks but his. Dated "au Chastel de Torsy" [Château de Torchy], August 13. This is probably from Charles, the first Duke of Bourbon, who joined the Dauphin's party against King Charles VII. about 1435.

XLI. Petition from the Colleges of Eton and Cambridge to the King, to appoint a Commission consisting of Maister Richard, one of the King's Chaplains, John Pye, the

No. 5.—Chronological List of Documents, &c.—*continued.*

King's Stationer, "and othere suche as ben connyng and have undrestondynge in such "matiers," for the purchase of books, vestments, &c., especially all those belonging to the late Duke of Gloucester, who had been murdered a month previously, for the use of the said Colleges. Returned under the King's Sign Manual to the Chancellor for the issue of the necessary Letters Patent on the 21st March 1447.

XLII. Letter from the King to James II. of Scotland, exhorting him to put a stop to the outrages committed by his subjects upon the English in the face of the existing truce. Garter King of Arms carries back the King's answer to the letter which the Scotch King had sent by Lyon King of Arms. Dated at Westminster, May 18, 1454. This document bears the signatures of the Bishops of Winchester, Ely, Norwich, and Lincoln, the Earls of Salisbury, Oxford, and Worcester, and the Lords Bourgchier and Stourton.

XLIII. Petition to the Duke of York, Protector, from Colin de Margny, a Norman who had been taken prisoner by Englishmen, for letters of protection in order to enable him to obtain his ransom. Returned to the Chancellor, under the signatures of the Protector, the Archbishops of Canterbury and York, the Bishops of Winchester and Rochester, the Earls of Devon and Worcester, the Lords Stourton, Bourgchier, and Stanley, and the Prior of St. John, on December 30, 1454.

Edward IV.

XLIV. Writ of Privy Seal for the execution of Letters Patent of protection in favour of Albert, Bishop of Lubeck ; Knout, Bishop of Wiborg ; Eric Otho, Seneschal of Denmark ; Nicholas Ramowe, Marshal of Denmark ; Strang Nicholason, Axell Laweson, John Oxe, and George Lawrenson, Knights; John Nicholas, Chancellor of Denmark ; Escall Guy, Knight ; Master Jaspar, Dean of Copenhagen ; and John de Embek, the King's Secretary, Ambassadors from King Christian of Denmark to the Court of England. Date, 1473.

XLV. Letter from the Queen, signed by her own hand, to Sir William Stoner, threatening him with the law for having taken upon himself "uncourteisly to hunt and slee "our deer withynne oure Forest and Chace of Barnewood and Exsille to our grete "mervaille and displeasir." Dated at Greenwich, August 1.

XLVI. Remission of Court by Henry Stafford, Duke of Buckingham, signed by the Duke himself. Dated May 12, 1477.

XLVII. Minute of a Council held by the King with his Nobles at the "Village called "Seyntre within Vermondose, a litell from Peronne," in which Lord Howard, the Master of the Rolls, the Dean of the King's Chapel, and Sir Thomas Selynger were empowered to treat with Louis XI. for a truce and the withdrawal of the English army out of France, the basis of their negociation being the payment of 125,000 crowns within the first 12 months and 50,000 crowns yearly during both Kings' lives, and the marriage of the Dauphin with the King's eldest or second daughter. King Louis to defray all costs, and to allow the Princess 60,000 livres a year.

This document is dated on the 13th of August 1475, and bears the autograph signatures of the King, and his brothers the Dukes of Clarence and Gloucester, the Dukes of Suffolk and Norfolk, the Bishop of Lincoln, the Marquis of Dorset, the Earls of Northumberland, Pembroke, and Douglas, the Lords Scrope, Stanley, Hastings, and Ferrers, Sir Anthony Grey, Sir William Parr, Sir Thomas Mongomery, Sir Thomas Burgh, Sir Richard Tunstall, John Elryngton, and Pers Courtenay.

XLVIII. Remission of Court by Henry Stafford, Duke of Buckingham, signed by the Duke himself. Dated August 20, 1477.

XLIX. Remission of Court by Richard, Duke of Gloucester, signed by the Duke himself. Dated November 14, 1477.

L. Letter missive from the Duke of Gloucester, "Great Chamberlain, Constable, and "Admirall of England," to Sir William Stoner and Humphrey Foster, Esquire, desiring them to enforce payment of arrears of annuity due by William Idley and his sister Elizabeth to Anne Idley, "Maistres of Our Nursery." Dated at Middleham Castle, July 9.

Edward V.

LI. Signed Bill by the King to the Sheriff of Middlesex, commanding him to proclaim throughout his Bailwick that all persons in the enjoyment of 40 librates of land for the three last years, not being Knights, do appear before the King to receive the order of Knighthood. Countersigned by the Duke of Gloucester. May 1483.

LII. Warrant for the execution of Letters of Protection in favour of James de la Rosa, Physician, by Lord Hastings, "Lieut.-General of the Town and Marches of Calais," whose signature it bears. May 1483.

LIII. Letter from Simon Stallworthe to Sir William Stoner, describing the troubled state of affairs in London. The Queen still kept sanctuary at Westminster, the Prior of

No. 5.—Chronological List of Documents, &c.—*continued.*

which was in great trouble about certain goods delivered to him by the Marquess of Dorset. The Protector, with the Duke of Buckingham, and the rest of the Council, had been in the Council Chamber from 10 o'clock till 2, "but there wasse none that "spake with the Quene." Great preparations were in progress for the coronation, which is fixed for "this day fortnight as we say." The King was in the Tower. Dated at London, June 9, 1483.

LIV. Warrant under the Royal Sign Manual to the Lord Chancellor for the issue of writs summoning a Parliament to be held at Westminster, on the 25th of June next coming. This document is remarkable not only for the rarity of the signature, which differs materially from the two others of Edward V., given in Nos. LI. and LV., but also from the fact of the day fixed for the meeting of Parliament being that on which the Crown was offered to the Protector, who commenced his reign on the day after. No Parliament is supposed to have met during Edward's brief reign.

LV. Signed Bill for the appointment of Humphrey Starky, Chief Baron of the Exchequer, countersigned by the Duke of Gloucester. Delivered to the Chancellor, June 15, 1483.

LVI. Another letter from Simon Stallworthe to Sir William Stoner, on the same subject as the preceding. He writes that on the previous Friday Lord Hastings was beheaded "sone apone noon," and describes the deliverance of the young Duke of York by the Archbishop of Canterbury to the Protector, who received him at the door of the Star Chamber, "withe many lovynge wordys, and so departed with my Lord "Cardinale to the toure wher he is, blessid be Jesu Mery." The Archbishop of York and the Bishop of Ely are also taken to the Tower. Foster "is in holde and mene fer "hys lyffe;" and Mistress Jane Shore is in prison; "what shall happyne her I knowe "not." He prays to be excused more writing, as he is so ill he can scarcely hold his pen; an assertion apparently proved by the straggling uncertain characters of the concluding lines of his letter. Dated at London, June 21, 1483.

LVII. A receipt for making ink.

Richard III.

LVIII. Letter missive by the King to the Lord Chancellor, commanding him instantly to send him the Great Seal, which is necessary for the carrying out of his purposes with regard to his "rebelle and traytoure," the Duke of Buckingham. The usual writ seems not to have satisfied the furious haste of the King to take vengeance on his former adherent, for he adds, with his own hand, a long postscript in language strangely characteristic of his bold and vigorous nature, concluding with the words "for ther was never falss traytor better purvayde for, as this berrerre Gloucestre shall "shewe you." Dated at Lincoln, the 12th of October 1483.

LIX. Letter missive by the King to the Lord Chancellor, for the issue of Letters Patent upon the conclusion of a truce with Francis, Duke of Brittany. Dated at Pontefract Castle, June 10, 1484.

LX. Holograph letter from the King to the Lord Chancellor, commanding him to send in all haste to the King a pardon, under the Great Seal, to Sir Harry Wood, priest. This letter, like that about the Duke of Buckingham, although consisting only of two lines and a half, bears witness to the rapid, direct manner in which the King did everything which he took in hand.

Henry VII.

LXI. Signed Bill to permit John Melionek to purchase the corrody of John Paxman, in the Priory of St. Frideswide, Oxford. Dated March 1, 1486.

LXII. Letter from Anne, Duchess of Brittany, to "les grans Maistre et Escuier d'Angle-"terre." The Duchess acknowledges the receipt of the King's letter, by the hands of "the Doctor," and begs them not to carry out the King's orders to enter Rennes with the whole army, a display dangerous, unnecessary, and contrary to the terms of the King's former letters, but to come attended only by the number of men she had signified her wishes should accompany them to advise with her on the state of her affairs. She has long delayed the despatch of her Ambassadors to the King of France in expectation of their arrival, and sends them a duplicate of the said Ambassadors' instructions, assuring them at the same time that she has no intentions of coming to any conclusion with regard to them without the King's knowledge and approval, or of breaking in any way the good understanding between them, confident that the King will act with equal good faith towards her. Dated at Rennes, July 31 [1490].

LXIII. Receipt, signed by Queen Elizabeth, widow of Edward IV., for the arrears of her half year's pension of 400*l.* a year, granted her by the King. This document is important as tending to prove that the King, her son-in-law, has been unduly blamed for his treatment of her, and that the allegations of his having seized her property are, in the absence of any proof, probably unfounded. It is dated on the 21st of May 1491.

No. 5.—Chronological List of Documents, &c.—*continued.*

LXIV. Account of monies paid to divers persons in the year of the capture of Perkyn Warbeck or Osbeck, signed at head and foot by the King's own hand. Among the items are 482*l.* 16*s.* 8*d.* paid to the Mayor of Southampton, and others, in rewards for "besynes concernynge Piers Osebek," 5*l.* 18*s.* 4*d.* paid to Windsor Herald for "neces-"saries concernynge Dame Kateryne Huntley"—Lady Katherine Gordon, daughter of the Earl of Huntley, whom King James IV. had bestowed in marriage upon Warbeck—and 10*l.* 10*s.* to Robert Symonds, in reward "for causes concernynge Piers Osebek." 1497.

LXV. Extracts from one of the King's books of accounts. The first four pages are written entirely by the King's own hand, and every page, in many cases every item, is signed by him. These curious books give a great insight into the covetous money-making mind of the King, and contain evidence of some of his most questionable dealings, especially his employment of spies, of whom he appears to have had many in his pay. Among the names mentioned in these extracts is that of Empson, who was one of the King's most successful tools in raising money, and who was beheaded, together with Dudley, on Tower Hill, on the 17th of August 1510.

LXVI. Instructions given by the King to Francis Marsyn, James Braybroke, and John Stile, "shewing how they shall ordre theymself when they shall come to the presence "of the old Quene of Naples and the yonge Quene her daughter." These three persons were despatched to Valencia, in June 1505, as bearers of letters from the Princess of Wales to the Queen of Naples and her daughter Joan, widow of Ferdinand II. of Naples, under colour of presenting which they were to take minute notice of the state the said Queens kept; the number of nobles and ladies forming their Court, and their general bearing and demeanour. But more especially they were to note the personal appearance, health, and habits of the young Queen, whom the King then designed to marry, and to find out "in the wisest waye that they can use what land and "lyvelood" she was likely to have after her mother's death. They were also to employ a "conynge paynter" to "drawe a picture of her visage and semblance," and if he failed in producing a perfect likeness they were then to engage "the moste conynge "paynter that they can gete," and go on till success crowned their efforts. The answer to each instruction is written beneath, in a space left blank for the purpose, and the King's signature appears at the top of the first page. Some of the instructions were probably intended to be secret, and are perhaps not more minute than the importance of the occasion required, the fact of the King never having seen the Princess rendering it necessary that every precaution should be taken against his contracting an inauspicious marriage.

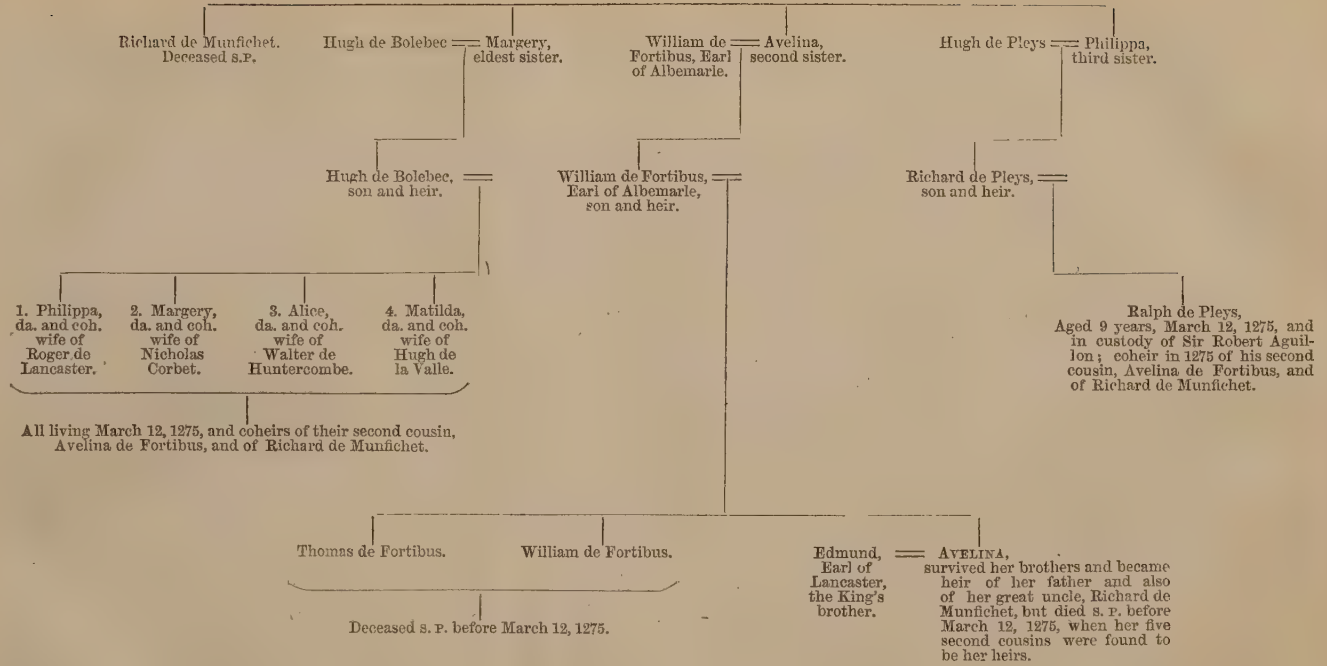
LXVII. Signed Bill for the appointment of Robert Reed, Chief Justice of the Common Pleas. 1507.

This and the other Signed Bill, No. LXI., are given principally to show the remarkable difference between the King's signature at the beginning and end of his reign.

APPENDIX TO PART I.

I. Writ and Inquisition post mortem, 38 Henry III., No. 24.—This is an inquisition taken at Salisbury, on Tuesday after the Annunciation of the Blessed Virgin, 1254, before James Fresel, the King's Escheator, upon the death of William de Cardunville, and gives a curious illustration of the laws relating to marriage and inheritance. This William de Cardunville, a tenant in chief of the King, had married a woman named Alice, with whom he had lived for 16 years, and by whom he had several children, one of whom, a boy, Richard, was living at the time the inquisition was taken, and would have been his heir; but about a year before the death of the deceased, a woman named Joan, by whom he had a son, also named Richard, many years previously, appeared and sued him in the Ecclesiastical Court as her husband, by virtue of a promise made to her by him, upon proof of which judgment was given in her favour, and the other woman, who had been his wife for 16 years, was divorced. The jury, however, doubting whether Joan's son Richard, aged 24 years, is really heir to the prejudice of Alice's son Richard, Joan, unlike Alice, never having been "solemnly espoused at the church door," return, in default of both, Robert de Cardunville, their father's brother, as his heir.

II. Writs and Inquisitions post mortem, 3 Edward I., No. 31, upon the death of Avelina, wife of Edmund, Earl of Lancaster, the King's brother, as to the property whereof she had died seised in fee as coheiress of her great-uncle, Richard de Munfichet. In one of the returns made before John of London, the King's Escheator, on Tuesday the Feast of St. Gregory, March 12, 1275, of the number of coheirs of Richard de Munfichet, their names and ages will be found, from which information the following pedigree, embracing the royal and noble families of Plantagenet, Lancaster, Bolebec of Northumberland, Corbet, Huntercombe, La Vale, Albemarle, Pleyz, and Montfichet, has been compiled;—


Richard de Munfichet. Deceased s.p.
Hugh de Bolebec = Margery, eldest sister.
William de Fortibus, Earl of Albemarle. = Avelina, second sister.
Hugh de Pleys = Philippa, third sister.
Hugh de Bolebec, son and heir.
William de Fortibus, Earl of Albemarle, son and heir.
Richard de Pleys, son and heir.
1. Philippa, da. and coh. wife of Roger de Lancaster.
2. Margery, da. and coh. wife of Nicholas Corbet.
3. Alice, da. and coh. wife of Walter de Huntercombe.
4. Matilda, da. and coh. wife of Hugh de la Valle.
All living March 12, 1275, and coheirs of their second cousin, Avelina de Fortibus, and of Richard de Munfichet.
Ralph de Pleys, Aged 9 years, March 12, 1275, and in custody of Sir Robert Aguillon; coheir in 1275 of his second cousin, Avelina de Fortibus, and of Richard de Munfichet.
Thomas de Fortibus.
William de Fortibus.
Deceased s. p. before March 12, 1275.
Edmund, Earl of Lancaster, the King's brother. = Avelina, survived her brothers and became heir of her father and also of her great uncle, Richard de Munfichet, but died s. p. before March 12, 1275, when her five second cousins were found to be her heirs.

[Richard de Montfichet was one of the 25 Barons elected to enforce the observance of Magna Carta.]

No. 5.—Chronological List of Documents, &c.—*continued.*

III. Writ and Inquisition post mortem, 12 Edward I., No. 3.—This inquisition, taken before Brother Robert of Vale Royal, the King's Escheator for Cheshire, relates to the death of Philip de Baunville, and the property whereof he died seised, among which are enumerated certain rents received by virtue of his office of Chief Forester of the Royal Forest of Wirral, which office the jurors return as worth 4*l.* in excess of the costs of the custody of the profits thereof. Joan, his eldest daughter, aged 20, Ellen, his second daughter, aged 9, and Agnes, his youngest daughter, aged 8 years, are returned as his coheirs. Annexed is a second writ and return to inquire into the truth and circumstances of an assertion made by one William de Stanley, that a marriage had been contracted between him and the deceased's eldest daughter Joan, "per verba de præsenti," words spoken in the presence of witnesses; and the return to this writ gives the following curious account of the betrothal and the circumstances under which it was made. The jurors say that on the Sunday after the feast of St. Matthew, Apostle and Evangelist, two years ago, which would be on the 27th of September 1282, Philip de Baunville, with his wife and family, was at a banquet given by Master John de Stanley, on which occasion Joan, suspecting that her father intended to marry her to her stepmother's son, and not being herself at all desirous of such a match, took means to avoid it by repairing with William Stanley to Astbury church, where marriage was contracted between them by the utterance of the following mutual promise; he saying, "Joan, I plight thee my troth "to take and hold thee as my lawful wife unto my life's end," and she replying, "I, "Joan, take thee, William, as my lawful husband." The witnesses to this verbal contract were Adam de Hoton and Dawe [Davy] de Coupeland.

Prepared and examined by

(Signed) William Basevi Sanders.

No. 6.—Specimen Calendar of the Patent Rolls, 1 Hen. III.

Column 1 gives the reference to the Roll; 2, the parties to whom the Letters are addressed; 3, the parties in whose favour the Grants are made; 4, a summary of the subject matter; 5, the date.

Memb.	Quibus Missæ.	Pro Quibus.	Summarium.	Apud.
16	Brian' de Insula -	W. Comite de Fe-rariis.	Castrum de Pecco usque ad xiiij. annum ætatis Regis.	Glouc. xxx. Oct.
„	Gerardo de Furnivall.	„ „ „	Castrum de Bolesour, ut supra.	—
„	Militibus, &c. -	„ „ „	Quod Milites, &c. de Castellariis de Pecco et de Bolesour ei sint intendentes.	xxx. Oct.
„	Abbati Sanctæ Crucis de Waltham.	Regina Isabella -	Quod Abbas de Waltham ei sit intendens de firma ejusdem villæ.	i. Nov.
„	Ballivis, &c. - -	Johanne de Cray, Mercatore Ambian'.	Securus conductus ad negotiandum, &c. per Angliam.	ij. Nov.
„		Gaufrido de Boc-land.	De conductu in veniendo ad loquendum cum Rege de pace sua.	iij. Nov.
„	G. de Nevill', Roberto Wodecoc et Laurentio de Dunewic, custodibus galiarum, &c. apud Scardeburc.	Stephano de Croy	De lanis, coriis, &c., quæ arestata fuerunt apud Scardeburc, ei deliberandis.	Theok. vj. Nov.
„		Willielmo Talebot	De conductu - - - -	xiij. Nov.
„	Hug. et Ric. de Saunford.	Elya de Antoriac -	Quod Hug. et Ric. de Saunford ei liberent Agatham uxorem Engel. de Cygoni et Oliverum filium suum, cum equis et hernesiis, &c.	Bristol. xiij. Nov.
„	Priori &c. de Alencestr'.	Priore &c. de Alencestr'.	Licentia Abbatem eligendi - -	xiiij. Nov.
„		Thoma de Nevill -	Salvus conductus in veniendo ad Regem.	"
„		Rog. de S. Lando, Waltero de Wyk, Thoma de S. Vygor.	De conductu.	
„		Warrino filio Gerold.	„ „ - - - -	
„		Abbate de Dor.	„ „ - - - -	„
„		Roberto Berkelay	„ „ - - - -	Divisas, xvij. Nov.
„	Omnibus - -	Abbate de Stanley in Wiltes.	Quietantia de jocalibus &c. ei commissis.	Bristol. xix. Nov.
„	„ „ „	Rog. de Lenham -	De xxxvj. marcis de redemptione sua in camera Regis receptis.	xx. Nov.
„	Brian'de Insul' -	W. Com. de Ferar'	Castrum de Pecco ei sine occasione et dilatione tradendum.	xviij. Nov
„		Thoma Gravenel -	De conductu - - - -	„
„	Hug. de Lacy -	Hug. de Lacy -	Ut secure veniat ad loquendum cum Rege, et ne Regi imputet ea quæ pater suus Johannes Rex erga eum deliquerit.	„
„	Rob. Marmiun -	Rob. Marmiun -	De conductu; et rogatur ut veniat ad pacem Regis.	„
„	G. de Nevill -	Nicho' Blundi, ballivo Stephani Nepotis J. quondam Papæ.	Ut pecunia Stephani Cardinalis capta apud Scardeburg ei liberetur.	„
„	Custodibus galearum, &c. apud Scardeburc'	„ „ „	Ut supra - - - - -	„
„	J. Bath. et Glaston. Episcopo.	Rob'to de Muscegros.	Quod ei liberet omnes denarios quos Regi debet de firma de Cungrebir'.	xx. Nov
„	Joh'i filio Ric'i -	Will'o Briwer -	Quod castrum de Lideford ei liberetur.	—
„	Rob'to de Veteri Ponte, Hug. de Bailloel, &c.	Fratre Rogero Templario.	De credentia.	—
„	Constab' Wind' et Berchamstede.	Waltero de Cumbrigg'.	Quod receptetur, si opus fuerit in castris de Windlesora et Berchamstede.	xx. Nov.
„	Petro de Maulay -	P. Winton. Episcopo et Huberto de Burg'.	Custodia Johannis filii primogeniti Will'i de Breuse.	xxj. Nov.
„	Pho' Marc' - -	R. Com. Cestr' -	Custodia Joh'is de Humez. - -	„
„	Petro de Maulay -	Cecilia de Albiniac' et Will'o filio suo.	Ut Simon frater ipsius Will'i eis liberetur, retentis tamen alio fratre et sorore ejusdem Will'i, scilicet Gaufrido et Matilda.	„
„	Pho' Marc' - -	R. Com. Cestr' -	De liberando ei Alanum de Mauton, qui antequam captus esset, se dederat domui de Rokesby habitum religionis ibidem suscipiendum.	„

No. 6.—Specimen Calendar of the Patent Rolls, 1 Hen. III.—*continued.*

Memb.	Quibus Missæ.	Pro Quibus.	Summarium.	Apud.
16	Petro de Maulay -	Hasculfo de Suleny	Quod Rob's Arsic ei liberetur - -	Bristol. xxij. Nov.
„		Gaufrido de Boc-land.	De conductu - - - -	Glouc'. xxvj. Nov.
„	Majori &c. Bristoll'	Pho' de Albini et P. Winton Episcopo.	Quod Major &c. Bristoll' eis liberent finem quem fecerunt cum Rege Johanne.	iij. Dec.
„	Petro de Maulay -	Savarico de Maloleone.	Quod Regin' de Cornhull, qui captus tenetur, ei liberetur.	ij. Dec.
„	Constab' Noting. -	Will'o filio Walteri nepote Rob'ti de Curcun. Cardinalis	Decem libratæ redditus in laico feodo -	xxix. Nov.
„		Will'o de Albun' -	Conductus ad perquirendum redemptionem suam.	
„		Simone de Talinton et Will'o de Engleby, clericis Will'i de Albun'.	De conductu - - - -	xxix. Nov.
„		Rob'to Marmiun -	„ „ - - - -	„
„	Priori de Warham	J. electa in Abbatissam de Shaftesbur'.	Saisina de abbatia de Shaftesburia &c.	„
„	Pho' Marc', Vic. Noting.	Will'o de Eyneford	Quod liberetur ut veniat ad Will'm Marescallum in conductu duorum virorum religiosorum, &c.	ij. Dec.
„	Briano de Insul' -	W. de Ferr', Com. Derb.	Iterum mandatur dicto Briano quod ei liberet castrum de Pecco.	i. Dec.
„	W. Ebor. Archiepiscopo.	W. Com. Pembroc.	Quod ei faciat habere mille libras de fine hominum de Beverlaco, quas ipse manuceperat.	ij. Dec.
„	Petro de Maulay -	Rob'to Lupo -	Will's Prahull priso ei datur a Rege in auxilium ad se acquietandum versus Lewelinum Principem Norwall'.	iij. Dec.
„	W. de Nevill', Camerar.	Goswino de Roulers.	Quod medietas quingent. et viginti novem librarum a nautis Regis ab eo captarum ei reddatur, retenta altera medietate ad opus Regis.	„
„	Rob'to Wudecok et aliis Galiotis apud Scardeburg.	„ „ „	Ut supra - - - - -	„
„	G. de Nevill' et Burgensibus de Scardeburg.	Joh'e Ruffo de Ipr'	Ut supra, de medietate viginti duarum librarum et decem solidorum.	„
„	G. de Nevill' -	Steph'o de Croy -	De lanis &c. ab eo arestatis apud Scardeburg, ei liberandis.	„
„	G. de Marisc', Justiciario Hibn'.	W. Mariscall, Com. Pembroc.	Quod habeat servitium Meyleri filii Henrici de terra quam de eo tenet in Lagenia, &c.	Bristol, ij. Dec.
„	Meylero filio Henrici.	„ „ „	Quod ei sit intendens de servitio supradicto.	—
„		Marger', quæ fuit uxor Joh'is de Turri	De conductu - - - -	Glouc. iij. Dec.
15	Joh'i Marescallo et Ballivis suis.	Comite W. de Marescallo.	Centum li' quas homines de Wigorn' promiserunt Joh'i Regi, per sic, quod muri Wigorn. non prosternerentur.	viij. Dec.
„		W. Comite Sarr' et W. Marescallo juniore.	De conductu - - - -	„
„	Omnibus Constab' &c.	Abbate et monachis de Rading'.	Protectio - - - - -	„
„	Willo' de Lascy -	Hugone quondam Decano Hereford. in Episcopum electo.	Saisina terræ, &c. episcopatus Hereford.	ix. Dec.
„	Tenentibus &c. de Episcopatu Hereford.	„ „ -	Quod ei sint intendentes.	—
„	Ballivis, &c. -	Eremino Bekin -	De conductu ad veniendum in Angliam cum uno frahello weidiæ, et quod inde auferat mercandisas ad valentiam prædicti frahelli.	Divisas. xij. Dec.
„	W. Ebor' Archiepiscopo.	Comite W. Marescallo.	Quod ei habere faciat mille libras de fine hominum de Beverlaco.	Oxon. xiij. Dec.
„	Petro de Maulay -	Rob'to de Columb'	Quod Rustenc de Solers, Lambertus de Bussay, et Alanus Basset prisones ei liberentur.	Glouc. xxj. Dec.
„	H. Sarr' Episcopo -	J. Abbatissa Shaftesbur' electa.	Quod manum consecrationis et munus benedictionis ei dignetur impertiri.	„
„	Alano Basset -	Waltero de Verdun.	Quod ei liberet duos homines Engerami de Cusey.	Oxon. xv. Dec.
„	Engel' de Cigony	„ „ „	„ „ „ „	„
„	G. de Marisc', Justicario Hib'n'.	Civibus Dublin. " -	De compoto suo audiendo de arreragiis finium &c. Regi debitorum.	„

No. 6.—Specimen Calendar of the Patent Rolls, 1 Hen. III.—*continued.*

Memb.	Quibus Missæ.	Pro Quibus.	Summarium.	Apud.
1	Pl'o Marc' -	Ric'o filio Reg' -	Quod ei liberet Walterum de Preston prisonem.	Oxon. xv. Dec.
„	Petro de Maulay -	Hugone de Vivone	Quod ei liberet Regin' de Cornhull -	„
„	Pl'o Marc' -	Pl'o Marc -	Quietantia de Will'o de Eyneford prisone.	Glouc. xv. Dec.
	Omnibus - -	Henr' de Manny, Joh'e Cretun, et Walt' de Abrichecurt.	Licentia revertendi in partes suas -	Oxon. xiiij. Dec.
„	„ „ -	Engeram' et Rob' de Campan' et Anselmo de Norhant.	„ „ „ „	„
„	Henr' filio Com' -	Rege - -	Quod accedat in partes Glouc' ad loquendum cum P. Winton Episcopo et Comite W. Marescallo de negotio Regis.	xvj. Dec.
„	Petro de Maulay -	Will'o Joyner -	Quod ei liberet Thomam Dacum prisonem, in solutione debiti quondam Regis Johannis.	Feyreford. xvij. Dec.
	G. de Serland -	Will'o de Forz', Com' Albemarl -	Custodia castri Salvat' - - -	„
„	Falkes de Breaute	- - -	Custodia castri de Rokingham -	„
„		Joh'e de Eselfeld et Waltero de Tywe.	De conductu - - - -	Glouc. xxj. Dec.
„	Hominibus de Wynynton et de Merthin.	Will'o filio Humfridi.	Villæ de Wynynton et de Merthin donec in beneficio ecclesiastico ei provideatur.	Oxon. xvj. Dec.
„		Rogero de Peauton	De conductu - - - -	Glouc. xviij. Dec.
„	G. de Marisc', Justic' Hib'n'.	H. Dublin' Archiepiscopo.	ccc. marcæ de denariis Regis. -	Oxon. xvj. Dec.
„	„ „ -	Civibus Dublin' -	Ea quæ de prisis eis debentur. -	„
„		Galfr'o de Longo Campo.	De conductu - - - -	Glouc. xxj. Dec.
„		Joh'e de Waukingham et Will'o de Stokes.	De conductu - - - -	„
„		Waltero de Dunstanvil.	De conductu - - - -	xxiij. Dec.
„	Ric' de Insul' -	W. Com' de Ferrar	Quod ei liberet castrum de Pecco. -	xxiij. Dec.
„	Omnibus - -	Ric'o de Insula -	Quietantia de castro de Pecco. -	„
„		Gilcb' de Clare -	De conductu - - - -	xxvj. Dec.
„	Omnibus - -	Thoma de Multon. clerico.	De conductu - - - -	xxvij. Dec.
„	Ric'o de Saunford	Alano filio Thomæ de Multon.	Quod ipse et homines sui capti deliberentur.	„
14	Omnibus - -	Engeram' de Boh'	De conductu pro navi sua. - -	xxvj. Dec.
„		Abbate et monachis de Malm'.	De protectione pro se rebus suis, &c. -	„
„		Will'o de Wrotham	De conductu - - - -	xxvij. Dec.
„		Tho' de S. Wygore	„ „ - - - - -	—
„	Ballivis, &c.	Steph'o de Crey -	„ „ - - - -	—
„	Omnibus de Com' Sussex.	Rob'to de Done et Gilb'to Campion'.	Quod eis fidem habeant super hiis quæ eis dixerint ex parte Regis.	„
„	Omnibus de Com' Surr' et Kanc'.	„ „ -	Ut supra, de Walliis, Quinque Portubus et de Com' Suhampt'.	—
„	G. de Aquila -	Rege - -	Quod redeat ad fidem Regis, &c. Et de castro de Peveneshel' deliberando.	—
„	Hominibus de Hib'n' qui cum navibus sunt in costera Norm'.	Rege - -	Quod veniant Wincheles' ad eundum in servitium Regis.	xxvij. Dec.
„	Waltero Scoto -	Gib'to Campion -	Quod navis sua quæ arestata fuerat, ei deliberetur.	Theok. xxviij. Dec.
„	Constab', &c. de Oreford.	Hamone Nerbon de Winchelese,	Quod ipse et homines sui de Sefford, capti, deliberentur.	„
„	Ballivis, &c.	Priore, &c. de Bradenestok.	Protectio pro se, rebus suis, &c.	„
„	Episcopo Wigorn' -	Math' in Abb'em de Alnecestr' electo.	Quod ei manum confirmationis et munus benedictionis impendat.	Not. i. Jan.
„	Tenentibus de Ab-b'ia de Alnecestr'.	„ „ „	Quod ei sint intendentes - -	„
„	Rob'to de Gaugy -	Laur' de Linc', Clerico Walteri de Lascy.	Quod deliberetur cum hernesio suo -	iiij. Jan.
„	Joh'i Extraneo et Ballivis suis Salop'.	H. Dublin' Archiepiscopo.	Quod possit facere collationes de præbendis in ecclesia B. Mariæ de Salop.	„
„	R. Comiti' Cestr' -	Will'o de Cantilupo	Quod ei liberet Eustachium Moreteyn prisonem.	v. Jan.

No. 6.—Specimen Calendar of the Patent Rolls, 1 Hen. III.—*continued.*

Memb.	Quibus Missæ.	Pro Quibus.	Summarium.	Apud.
14	Petro de Maulay -	Falkes' de Breaute	Rogerus de S. Andrea priso ei conceditur ad acquietandum Will'um de Breaute fratrem suum.	Not. v. Jan.
,	„ „ -	R comite Cestr' -	Quod ei liberet Will'um de Lancastr', prisonem.	„
„	Omnibus - -	Henr' filio Thomæ Blundi de Dereby	Pardonatio utlagariæ pro morte Hugonis filii Meisenc'	„
„	Ph'o Marc' -	Ada de Merl' -	Quod a prisona deliberetur, c. sol' ab eo receptis.	vj. Jan.
,	„ -	Thoma de Erdinton	Quod ei liberet Baldewinum de Paunton, prisonem.	„
„	Ph'o Marc' Vic' Noting.	Rogero Buzun et Ric'o de Hotot.	Quod eos liberet a prisona - -	„
„	Ph'o Marc' -	W. Maresc', Com' Pembr'.	Quod ei liberet obsides Will'i de Eyneford.	„
„	„ -	Rob'to Lupo -	Quod ei liberet Will'um de Veteri Ponte, prisonem.	„
„	Archiepiscopis, &c. de com' Linc'.	Galfr'o de Serland	Custodia comitat' Linc', sub domina Nic'ha de Haya.	vij. Jan.
„	Omnibus - -	Dn'a Nichol' de Haia et Galfr'o de Serland.	Quod omnes per eos secure veniant qui ad fidem Regis redire voluerint.	„
„	Majori, &c. Linc. -	„ „ „	Quod eis sint intendentes - -	„
„	Ph'o Marc' -	Hamone Bonet -	Quod eum liberet a prisona - -	„
„	„ -	Rob'to de Caorco -	„ „ „	—
„	Omnibus - -	Ph'o Marc' -	Manerr'" de Meleburn et villa de Bolewell, donec ei provideatur in lxxx. li' terræ.	vij. Jan.
	„ - -	Petro de Le Cres' Nich'o et Waltero fr'ibus suis.	Licentia eundi in peregrinationem in terram Ierosol'.	„
„	Henr' filio Com' -	Henr' filio Com' -	Quod secure veniat ad Regem usque Glouc', secum adducens quos venire voluerint ad fidem Regis.	Oxon. xiij. Jan.
,		Tho' Gravencl -	De conductu - - - -	xiiij. Jan.
,	Constab' de Divisis	Olivero et Galfrido de Bucevill.	Ricardus Gravenel eis conceditur ad redemptionem suam acquietandam.	„
„	Constab', &c. in castro Bedef'.	Rege - -	Grates pro servitio dictorum constab', &c. De redemptione aliquorum qui de castris Regis capti sint, per magnates acquietanda.	„
„	Hominibus de Gaunt.	Gerardo de Sotingh'	Quod ei liberent quingentas marcas quas Rex J. eis commodavit ad villam suam firmandam.	„
„	Rob'to et Hug' de Saunford.	Bernardo de Riun	Filia Willi' Paynel ad redemptionem suam.	„
„	Justic' Hib'n -	Rege - -	Quod nullus Hibernicus eligatur vel præficiatur in aliqua ecclesia cathedrali in Hibernia.	„
„	„ „ -	Rob'to Travers in Episcopum Laoniæ electo.	Saisina episcopatus Laoniæ - -	xv. Jan.
„	Archiepiscopo Cassel.	„ „ „	Quod dictum Robertum in Episcopum confirmet et consecret.	„
13	Omnibus - -	Goldouin' de Duc-	Primum maritagium quod in manus Regis acciderit.	xvij. Jan.
„	Vic' Oxon' - -	Henr' Alberti clerico.	Ratificatio concessionis quam Rex Joh'es ei fecit de domibus in Oxon quæ fuerunt Mossol' filio Sim' et Bonefey Judæorum.	xvj. Jan.
„	Rob'to de Curtenay	Regina Matre -	Custodia castri Exoniæ - - -	„
„	„ „	„ „ „	Quod eam recipiat in castro Exon', et domos et thalamos competentes ei habere faciat.	„
„	Ph'o Marc' -	W. Com' de Ferrar'.	Manerium de Meleburn usque ad quartum decimum annum ætatis Regis.	„
„	Justic' Hib'n -	Rege - -	Ut rejectis Hibernicis, clerici Anglici ecclesiis cathedralibus, &c. in Hibernia præficiantur.	xvij. Jan.
„	Ph'o Marc' -	Thoma de Paris et Ric'o filio Petri.	Ut deliberentur per obsides, a custodia Regis.	„
„	Tenentibus de maneriis de Rugeleg' et Kannok.	Episcopo Lichef' -	Redditio maneriorum de Rugeleg' et Kannok, quæ Rex R. dedit et Rex J. confirmavit ecclesiæ Licetfeld.	„
„	Omnibus - -	Pagano de Chaorc'	Licentia eundi in patriam suam ad redemptionem suam perquirendam.	xvj. Jan.
„	Rogero Pipard -	G. de Marisco, Justic' Hib'n.	Quod ei liberet castrum de Rath -	xvij. Jan.
„	Ric'o de Burgo -	„ „ „	Quod ei liberet castrum de Karlingeford.	„
„		Rad'o Harang' -	De conductu - - - -	„

No. 6.—Specimen Calendar of the Patent Rolls, 1 Hen. III.—*continued.*

Memb.	Quibus Missæ.	Pro Quibus.	Summarium.	Apud.
13	Omnibus - -	Omnibus ad fidem Regis redire volentibus per Hamonem Militem.	Libertates, &c. - - - -	Oxon. xvj. Jan.
„	„ - -	Ut supra, per Will'm de Casingham.	„ „ - - - -	„
„	Nigello Gaydun -	Pagano de Chaorc'	Septem marcæ quas dictus Nigellus debuit Regi Johanni pro vino capto apud Freimantell.	„
„		Reymundo de Jernac.	De conductu - - - - -	xx. Jan.
„	Omnibus de com' Kanc'.	Ph'o de Albin' -	Quod ei sint intendentes ad commodum Regis, &c.	„
„	Omnibus de com' Surr', Sussex, Waldis Sussex, com' Suth't, Bar' de Quinque Portubus.	„ „ -	„ „ „ „	„
„	Omnibus - -	Petro de Lettes Nich'o et Waltero fratribus suis.	Licentia invadiandi terras suas - -	xvj. Jan.
„	G. de Marisc', Justic' Hib'n.	Waltero de Lascy -	Castra, &c. quæ fuerunt Ric'i del Tuyt, reddendo cc. marc' ad Scc'm Dublin.	Glouc. xxiij. Jan.
„	Will'o de Lacy -	G. de Marisc', Justic' Hib'n.	Castra de Rath et de Carlingford.	„
„	Justic' Hib'n -	W. de Lacy - -	Castrum de Drogeda et cantredum de Armaill; ad quartum decimum annum ætatis Regis.	Oxon. xx. Jan.
„	„ „ -	R. de Mar' Cancellario.	Custodia archiepiscopatus Armach'	xxij. Jan.
,	Omnibus de archiepiscopatu Armach'.	„ „ „	Quod ei sint intendentes - -	xxiij. Jan.
„	Suffragan' Armach'	„ „ „	„ -	—
„	Dec' et Cap'lo Armach'.	Rege - - -	Quod non præsumant eligere Archiepiscopum sine assensu Regis.	xxiij. Jan.
„	Suffragan' Armach'	„ - - -	„ „ „	„
„	Offic' Episcopatus	Thoma de Wallingf'	Ecclesia S. Mich'is in Wallingford	xxvij. Jan.
„	Omnibus - -	Rob'to de Sco' Gormon.	De conductu - - - -	„
„	„ - -	Rad'o de Norwic' -	Decanatus capellæ Regis de Wallingford.	xxvij. Jan.
		Walt' de Wysebech, Rob' de Wynton, et Ric' Cornubiens', Canonicis Ebor'.	De conductu.	—
	Abbi' et Con' de Bello Loco.	Rege - -	Quod curam capiant de equitio Regis in Nova Foresta.	xxvij. Jan.
„	Petro de Maul' -	Hug' de Mortuo Mari.	Terræ inimicorum Regis quæ sunt de feodo suo.	—
„	Omnibus - -	Engeramo de Bohun.	Protectio - - - - -	Rading. xxxj. Jan.
„		David de Hasting	De conductu - - - -	Oxon. xxx. Jan.
„	Ballivis, &c. - -	Simone Midensi Episcopo et successoribus suis.	Mercatum de Nova Midia - -	Glouc. iij. Feb.
„	Omnibus - -	Eustachio de Moreteyn.	Terræ quas habuit ante initium guerræ, per finem.	iiij. Feb.
„		Will'o Grassus -	De conductu - - - -	v. Feb.
„	II. Linc' Episcopo	Priore et Conventu de Newenham.	Ecclesia de Tindene in recompensationem damni quod Rex Johannes eis fecit quando dirui fecit ecclesiam S. Pauli de Bedeford ad castrum ibidem firmandum.	„
„	Petro de Maulay -	Rob'to de Rokelce	De obsidibus suis liberandis - -	„
„	Isabellæ de Mortuo Mari.	Falkesio de Breaute	Debitum quod dicta Isabella Regi Johanni debuit.	vj. Feb.
„	Ph'o Marc' - -	W. Com' Dereb' -	Saisina manerii de Meleburne - -	v. Feb.
„	Tenentibus de Episcopatu Sarr.	Thoma de Discy et Rad'o de Bray.	Custodia Episcopatus Sarr' - -	vj. Feb.
„	Omnibus - -	Will'o de Lond', clico, nepote H. Dubl' Archiepiscopi.	Confirmatio concessionis Joh'is Regis de domibus quæ fuerunt Bonechos' et Deulacresse Judæorum, Oxon.	vij. Feb.
„	„ - -	Henr' filio Com' -	Comitatus Cornub', sicut Regin' Com' Cornub' pater suus illum tenuit.	„
„	- - - - -	Episcopo Imelac' -	De protectione - - - -	xxiij. Jan.
„	- - - - -	Episcopo Limeric -	„ „ - - - -	„
„	Omnibus - -	Henrico Abb'i clerico.	Domus in Oxonia quæ fuerunt Mossoll' filii Simonis et Bonefei, Judæorum.	viij. Feb.

No. 6.—Specimen Calendar of the Patent Rolls, 1 Hen. III.—*continued.*

Memb.	Quibus Missæ.	Pro Quibus.	Summarium.	Apud.
13	Ph'o Marc' - -	Rad'o de Wylinton	Quod ei liberet Will'um de Diva prisonem, ducendum ad W. Comitem Pembroch' - - - -	Glouc. ix. Feb.
„	Archiepiscopis et aliis Hibn' constitutis.	Archiepiscopis et aliis Hibn' constitutis.	De libertatibus suis in Hib'n' guadendis, &c.	vj. Feb.
12	Ph'o Marc', Vic' Noting'.	Thoma de Parisius et Ric'o filio Petri de Ponte.	Quod eos a prisona liberet per obsides	xij. Feb.
„	Omnibus - -	Domina Nichol' de Haya et Ric'o de Campvill' filio suo.	De protectione - - - -	„
„	Ph'o de Albyn' -	H. de Burgo et aliis	De fide eis ex parte Regis habenda -	xiij. Feb.
„	Omnibus - -	„ „ „	Conductus pro triginta hominibus per dictum H. et alios conducendis usque La Legh juxta Kiam.	„
„	Ballivis, &c. - -	Rad'o de Norwic', cl'ico.	Conductus in Hibn' in nuntium Regis proficiscendo.	„
„	Omnibus - -	Hug' Poins -	Conductus pro illis qui ad fidem Regis redire voluerint per dictum Hugonem.	„
„	G. de Mar', Justic' Hibn'.	Rege - -	De vacua terra inter aquam et murum civitatis Waterford danda ad inhabitandum.	xv. Feb.
„		Rob' de Berkeleg' -	De conductu - - - -	xvj. Feb.
„	Officiario Norwic' -	Henr' de Ormesby -	Medietas ecclesiæ de Seing, ratione terræ Ric'i de Seing in manu Regis.	xvij. Jan.
„	Omnibus - -	Will'o de Brossell -	Conductus in eundo per terram cum rebus suis, &c.	Oxon. xxj. Feb.
„	Constabulariis -	Ada de Gurdun -	Quod admittatur in castris Regis, cum gente sua.	„
„	Ric'o de Sanford et Rad'o de Bray.	Galfro de Gorseleg'	Quod deliberetur a prisona pro Will'o de Hoyland et aliis.	xx. Feb.
„	Ph'o Marc' - -	Geroldo de Normanvill.	Quod Thomas frater suus, obses ejus, liberetur, per finem quem Rad'us pater suus fecit.	Rading. xxj. Feb.
„	Hominibus de Shrivenham.	Henr' de Trublevill	Manerium de Shrivenham quamdiu Regi placuerit.	xxiiij. Feb.
„		Roberto de Chebbesye.	Ecclesia de Swinnerton (terra Rob'ti de Swinnerton in manu Regis).	„
„	Ballivis - -	Hugone de Lascy -	Conductus pro se et suis quos ducit ad fidem Regis.	„
„	Rob'to de Curtenay	Regina Matre Regis	Cuneum et stagnaria Devon, ad se sustentandum.	Certesyc. xxv. Feb.
„		Simone de Abbendon.	Conductus pro se et suis in negotiando	„
11	Omnibus - -	Rogero Le Horn et aliis.	De recipiendo eos qui ad fidem Regis redire voluerint.	Lewes. ij. Mar.
„		Will'o Bardulf et Rob'to Borchard.	De conductu - - - -	Shorham, iiij. Mar.
„		Osmundo de Calvo Monte.	„ „ - - - -	Guldeford v. Mar.
„		Will'o Aumar' -	„ „ - - - -	Fernham. vj. Mar.
„	Hominibus de Basingestok.	Barth'o Pecche -	Custodia manerii de Basingestok -	vij. Mar.
„	Omnibus de partibus Odiham.	„ „ -	Custodia partium Odiham - -	„
„	Ballivis - -	Rogero de Hida -	Protectio pro se et amicis suis quos ad fidem Regis attrahere poterit.	viij. Mar.
„	Omnibus - -	Hillar' Trussebut -	De conductu - - - -	ix. Mar.
„	Hominibus de Aulton.	Enniger' de Bohun	Custodia manerii de Aulton - -	viij. Mar.
„		Abbate et Canon' de Dereford, Ric'o et Waltero de la Bere.	Protectio - - - - -	ix. Mar.
„	Omnibus - -	Rob'to de Den' -	De recipiendo eos qui per dictum Robertum ad fidem Regis redire voluerint.	xj. Mar.
„	„ - -	Hug' Sansaver et Eva uxore ejus.	De conductu - - - -	„
„	Episcopo Linc' -	Joldewino de Due	Firma quam dictus episcopus Regi debet de manerio de Ceddre.	„
„	Domino Ba'thon -	„ „ „	Ut supra de maneriis de Bathonia et Cungreburn'.	„
„	Omnibus - -	„ „ „	Firma trium maneriorum ut supra; de qua dicti episcopi ei respondeant.	„
„		Will'o Maudut -	Conductus in veniendo ad Com' W. Mar' ad loquendum cum eo de deliberatione R. patris sui.	Farnham. xj. Mar.
		Rogero de Alneto'	De conductu.	„
„		Servientibus in castro de Farnham.	Conductus in eundo usque London -	xij. Mar.

No. 6.—Specimen Calendar of the Patent Rolls, 1 Hen. III.—*continued.*

Memb.	Quibus Missæ.	Pro Quibus.	Summarium.	Apud.
11	Omnibus - -	Hominibus de Mapeldereh' et Petrefeud.	Protectio - - - - -	Farnham. xij. Mar.
„		Petro Thebert' -	Conductus - - - - -	xiij. Mar.
„		Rogero But -	Conductus in veniendo ad Com' W. Maresc' ad loquendum de pace sua.	Winton. xiiij. Mar.
„		Rogero de Scures, Rogero filio Henr' Ada de Portesye, et Will'o de la Faleise.	De conductu - - - - -	„
	Tenentibus de maner' de Mapeldureham et Petrefeld.	Rogero la Szuche -	Custodia maneriorum de Mapeldoreham et Petrefeud (salva dote Milisent, quæ fuit ux' comit' Ebroic').	„
„	Petro de Maulay -	W. Comite Sarr', avunculo Regis.	Castrum de Shyreburn et comitatus Somerset.	„
„	„ „ „	„ „ „	Quod ei liberet castrum et comitatum supradicta.	xv. Mar.
„		Henr' de Tracy, Eudone filio Warin' Alano filio Warin'.	De conductu - - - - -	„
„	Tenentibus de terris Will'i de S. Joh'o.	Johanne Marescallo.	Terra Wil'i de S. Johanne ad se sustentand'.	„
„	Ballivis de com. Suthamp'.	„ „ „	„ „ „ „ „	—
„		Aluredo de Linc' -	De conductu - - - - -	„
„	Tenentibus de villa de Clafford.	Amaurico de Sco' Amando.	Villa de Clafford ad se sustentandum -	„
„		Jordano de Clinton et Godeheut, uxore Walteri de Esseleg'.	De conductu - - - - -	„
„		Ada de Chaorc' et aliis.	„ „ - - - - -	„
„	Tenentibus de manerio de Dunham.	Falkes' de Breaute	Manerium de Dunham ad se sustentand'.	„
„	Tenentibus de Karleton.	„ „ „	Karleton, cum soka, &c. - - -	„
„	Tenentibus de manerio de Bampton.	„ „ „	Manerium de Bampton - - -	„
„		Will'o de Maresc' -	De conductu in eundo usque London.	„
„	Johanni Marescallo.	Waltero de Cantilupo.	Custodia castri, comitatus, et forestariæ Wigorn, salvo manerio de Feckeham.	„
„		Will'o de Sancto Johanne.	Conductus in veniendo ad loquendum cum Com' W. Mar' de pace sua.	xvj. Mar.
„		Rob'to de Curten'	Conductus pro illis qui per dictum Robertum ad fidem Regis venire voluerint.	„
„		Rogero de Pantesbur'.	Conductus - - - - -	„
„	Tenentibus de manerio de Fernham.	Thoma Basset, juniore.	Manerium de Fernham ad se sustentandum.	xvij. Mar.
		Jordano del Estre	Conductus - - - - -	„
„	Petro de Maulay -	Will'o de Cantilupo.	Saisina manerii de Worl ei adjudicata per judicium Curiæ Regis.	„
„		Thurstano Dispensar.	Conductus in veniendo ad Com. W. Marescallum ad loquendum de pace sua.	„
„		Rad'o de Ely -	Conductus in eundo per potestatem Regis.	xviij. Mar.
„		Henr' Hose -	Conductus in veniendo ad Com' W. Mar' ad loquendum de pace sua.	„
„	Omnibus - -	Abbate et Conventu de Croxeston.	Centum sol' terræ in manerio de Tyndene, pro anima Regis Johannis.	„
„	Tenentibus de terra Ric'i de Warneford.	Waltero de Clifford	Terra quæ fuit Ricardi de Warneford, in hundredo de Awelton.	
„		Ricardo Le Bret, Juliana sorore sua, &c.	Conductus in eundo ad Rogerum de Brausa.	
„	Tenentibus de manerio de Axeford.	Rogero de Clifford	Manerium de Axeford, quod fuit Radulphi de la Bruere.	„
„	Omnibus - -	R. Cicestr' Episcopo.	Protectio pro illis qui per eum ad fidem Regis redire voluerint.	„
„		Steph'o Harengod	Manerium de Hosspreng ad se sustentandum.	„
„	Tenentibus de manerio, &c. de Fekham.	Johanne Mar' -	Manerium et foresta de Fekham ad se sustentandum.	„
„	Omnibus - -	„ „ „	De custodia manerii et forestæ de Fekham, ut supra.	„

No. 6.—Specimen Calendar of the Patent Rolls, 1 Hen. III.—*continued.*

Memb.	Quibus Missæ.	Pro Quibus.	Summarium.	Apud.
11	Tenentibus de terris Petri filii Herberti.	Olivero fratre Regis.	Terra quæ fuit Petri filii Herberti, ad se sustentandum.	Winton. xviij. Mar.
„	Omnibus - -	„ „ „ „	„	xx.
„	Tenentibus de manerio de Watlinton.	Nicholao de Molis	Manerium de Watlinton, quod fuit Will'i Painel, ad se sustentandum.	„
„	Tenentibus, &c. -	Willielmo Briwerr'	Terra quæ fuit Matildis de Chandos in com' Dors' et Somers', et Henrici de Columbariis in Wellaneton.	„
„		Johanne Bonvaslet	Conductus - - - -	„
„	Bruno Wascon' -	Rege - -	De distringendo Ricardum Gravenell ad debitum Regi persolvendum.	„
„		Philippo de Columbariis.	Conductus in veniendo ad loquendum cum Com. W. Mar'.	
„		Paris', monacho Clunn.	Conductus - - - - -	„
„	Tenentibus de honore de Hamslape.	Henrico de Braybœf.	Honor de Hamslape, et terræ quæ fuerunt Roberti Maudut, Camerarii, ad se sustentandum.	„
„		Joscelino de Alta Ripa, clerico.	Conductus in eundo per potestatem Regis.	„
„	Elyæ de Bello Campo.	Thoma de Bello Campo', Johanne de Beaumes, et aliis servientibus Regis.	Quod eos per Mathæum de Bekistrop arestatos deliberari faciat.	„
10	Archiepiscopis, &c. de com. Sutht'.	Johanne Marescallo.	Custodia comitatus Suhampton -	xxj. Mar.
„	Tenentibus de manerio de Berton.	Elya de Marevill -	Manerium de Berton, quod fuit Roberti Peverell, ad se sustentandum.	„
„		Henrico Huese -	Conductus - - - - -	„
„	Majori, &c. de Winton.	Britone Balistario	Pondus civitatis Winton' et Porta boreali civitatis, cum exitibus, ad se sustentandum.	„
„		Thurstano Dispensar.	Conductus - - - - -	„
„		Rogero de Alneto -	„	—
„		Petro Saunguin -	„	—
„		Huberto Husatus	Protectio - - - - -	„
„	Ballivis, &c. -	W. Marescallo, juniore.	Terra quæ fuit Adæ de Bendenges, ad se sustentandum.	xxij. Mar.
„	Com' Baron' et aliis de Foresta Frigidi Mantelli et Penbere.	Bartholomæo Pecche.	Custodia forestæ Frigidi Mantelli et Penbere.	„
„	Ph'o Marc' -	Willielmo de Album.	De Nicholao filio suo in obsidem recipiendo, pro Agatha uxore sua.	„
„	Petro de Maulay -	Willielmo de Lancastr'.	Quod eum deliberet, et mittat usque Glouc.'	„
„	Joh'i Maresc' -	S. Wigorn' Episcopo.	Quod ei habere faciat ballium castri Wigorn. jus ecclesiæ suæ, retenta mota ad opus Regis.	„
„	G. de Marisc', Justic' Hib'n'.	G. Archiepiscopo Cassalensi.	Quod mandatum Papæ ei fieri faciat -	„
„		Petro de Joynny -	Conductus - - - - -	„
„		Domina Regina -	Protectio - - - - -	xxiij. Mar.
„		Cant'Archiepiscopo	„ - - - -	„
„	Ph'o de Albun -	Rege - -	Quod navem quam saisiri fecit, mittat cum vinis, &c. ad castrum Dovor' muniendum.	„
„	Engelardo de Cigon'	Waltero Bruno -	Quod eum deliberet, et mittat usque Winton.	„
„		Margareta, uxore Will'i de Ponte Arch'.	Conductus in eundo ad deliberationem viri sui perquirendum.	„
„	Forestariis, &c. de Nova Foresta.	Johanne de Monemuta.	Nova Foresta, tanquam jus suum, ex parte Ceciliæ uxoris suæ.	„
„	Petro de Maulay -	Will'o de Albiniaco	De Agatha Trussebut uxore sua ei deliberanda.	xxij. Mar.
„		Will'o de Chanton	Conductus - - - - -	xxiiij. Mar.
„	Hominibus de Welhop, &c.	Jacobo de Poterne	De terra de la Poterie de Welhop ei reddita.	„
„		Will'o de Wrotham, Archid' Tauton.	Conductus in eundo ad loquendum cum Rege, &c.	xxv. Mar.
„		Agnete, quæ fuit uxor Rob'ti Hardwine de Suhampt'.	Protectio - - - - -	„
„		Waltero de Dunstanvill.	Conductus in veniendo ad Regem -	„
„	G. de Marisc', Justic' Hib'n'.	H. Dublin. Archiepiscopo.	ccc. marcæ quas Rex ei debet - -	xxvij. Mar.
		Gilberto de Clare -	Conductus in veniendo ad loquendum cum W. Com. Mar'.	„

No. 6.—Specimen Calendar of the Patent Rolls, 1 Hen. III.—*continued.*

Memb.	Quibus Missæ.	Pro Quibus.	Summarium.	Apud.
10		Will'o de Acre et Thomade Gravenell	Conductus in veniendo ad loquendum cum W. Com. Mar.	—
„		Rad'o Pincerna -	„ „ „	Winton. xxvij. Mar.
„	Briano de Insula -	Hominibus de Beverlaco.	Quod obsides deliberentur, si ipsi solverint mille libras quas debuerunt patri Regis.	„
„	Petro de Maulay -	Waltero de Lascy -	Quod ei liberet Roesiam neptem suam, filiam Hugonis de Lascy.	xxviij. Mar.
„	Præpositis, &c. de Otreburn.	Rad'o de Langetoft	Villa de Otreburn ad se sustentandum	„
„	Præpositis, &c. de Ringwode.	Will'o filio, Com. W. Mar'.	Manerium de Ringwode quod fuit S. Comitis Winton.	„
„		Galfrido de Appelton.	Conductus ad veniendum ad loquendum cum Com. W. Mar'.	„
„	Sen' Wascon' -	Eymerico Parvo Balistario.	Saisina de terra de Kablan, Kynzac, et Sancto Kabrar quam Rex J. ei dedit pro homagio, &c.	„
„	Ph'o Marc' -	Will'o de Folevill -	Quod deliberetur a prisona, ut ducat in uxorem filiam Eustachii de Es' per finem xxx. marcarum.	„
„		Will'o de Calabre serviente Thebaldi Blundi.	Conductus in veniendo usque Winton -	„
„	Omnibus - -	Eymerico Parvo Balistario.	Ratificatio donationis quam ei fecit J. Rex de terra de Kablan, Kynzac, et Sancto Kabrar.	„
„	G. de Marisc', Justic' Hib'n'.	Dublin. Archiepiscopo.	De DLX. marcis, quas Rex ei debet, ei solvendis, vel manceriis, &c. ei assignandis.	xxix. Mar.
„	Archiepiscopis, &c. de com' Wigorn'.	Waltero de Bello Campo.	Custodia comitatus Wigorn' - -	xxx. Mar.
„	J. Marescallo -	„ „	Quod ei liberet castrum Wigorn'.	—
„	Ric'o de Samford -	Joh'e Marescallo -	Ut supra, de castro Divisarum - -	„
		H. Casalensi Archiepiscopo.	Protectio - - - - - -	„
„	G. de Marisc', Justic' Hib'n'.	„ „	De custodia episcopatus Laon' - -	xxxj. Mar.
„	Majori, &c. Burdeg'	Gerardo Brochard, Mag'ro Militiæ Templi et confratribus suis.	Attornatio ejus ad recipiendum redditum civitatis Burdegal', donec eis satisfactum fuerit de debito quod Rex J. eis debuit.	„
9	Regin' de Pontibus, Senesc' Pict' et Wascon'.	„ „	„ „ „ „	xxx. Mar.
„	Sen' Wascon' -	„ „	Quod redditum prædictum eis habere faciat.	„
„	Archiep'o Burdeg'	„ „	Quod homines Burdeg' inducat ad redditum prædictum solvendum.	„
„		Waltero Le Brun -	Conductus - - - - - -	xxxj. Mar
„		Waltero de Wudeford.	„ - - - - -	„
„	Omnibus - -	Britone Balistario	Pondus civitatis Winton et porta boreali civitatis ejusdem ad de sustentandum.	xxx. Mar.
„	Joh'i Marescallo -	Waltero de Bello Campo.	Mota castri Wigorn', salvo Episcopo, ballio castri.	i. Apr.
„	Omnibus in villa et castro Divisarum.	Johanne Marescallo	Custodia castri Divis' - - -	„
„		Boydino de Harleberg'.	Conductus - - - - -	ij. Apr.
„		Milone de Wascberg'.	„ - - - - -	„
„		Alex'o Ither de Burdegal' et Ither fratre suo.	Conductus eundo cum navi, &c. ad negotiandum.	iij. Apr.
„		Eustacio de Fauke-berg.	Protectio - - - - -	„
„		Will'o de Cyrencestr'.	„ - - - - -	„
„		D. Cassalensi Archiepiscopo.	Conductus in eundo in Hiberniam -	„
„		Waltero de Fauco-berg et Wal' de Lumbr'.	Conductus in eundo in Flandriam -	iiij. Apr.
„	Will'o Blome -	Ric'o filio Alex'i de Binteworth' cl'ico Rothomag' Archiepiscopi.	Quod deliberetur a prisona - -	„
„	Constab' Windes. -	Nicholao et Thoma de Winton.	Quod deliberentur a prisona - -	„

No. 6.—Specimen Calendar of the Patent Rolls, 1 Hen. III.—*continued.*

Memb.	Quibus Missæ.	Pro Quibus.	Summarium.	Apud.
9	Rob'to de Curten'	Reginam matre Regis	Quod ei habere faciat aulam et magnum thalamum castri Exon'.	Winton. v. Apr.
„	Petro de Maulay -	Jord' La Warre -	Quod deliberetur a prisona - -	vj. Apr.
„	Tenentibus de manerio de Gumesholne.	Eustachio de Es' -	Quod ei sint intendentes - -	„
„	Archiepiscopis, &c. de Pictav' et Gascon'.	W. Burdegal' Archiepiscopo.	Senescalcia et custodia terræ Pictav' et Gascon'.	viij. Mar.
„	Omnibus de civitatibus, &c. Pictav' et Gascon'.	„ „	„ „ „ „	„
„	Regin. de Pontibus, Sen. Pict' et Gascon'.	„ „	Quod terram Pictav' et Gascon' ei liberet. Et quod ipse votum peregrinationis suæ executioni daret.	„
„		Godcholt, uxore Walteri de Esseleg	Conductus - - - - -	vj. Apr.
„		Will'o de Rumely -	„ - - - - -	„
„		Boidino, homine Petri de la Warre.	Conductus in eundo de Suth't usque Bristoll, cum uno fraillo weidiæ.	vij. Apr.
„		Jordano de Elinton	Conductus - - - - -	„
„	Engelardo de Cigony.	Thoma le Gilur, Petro l'Enfant, et aliis.	Quod deliberentur a prisona - -	„
„	Savarico de Malo Leone,	Heur' filio Regin' de Wincheles.	Quod deliberetur a prisona - -	viij. Apr.
„	Tenentibus de terris quæ fuerunt S. Com. Winton.	W. Marese', jun. -	Terræ quæ fuerunt S. Com' Winton, ad se sustentandum.	ix. Apr.
„	Tenentibus de terris quæ fuerunt Comitis David.	„ „	Terræ quæ fuerunt Comitis David -	„
„		Abbatissa de Wherewell.	Protectio - - - - -	„
„		Rob'to de Fresney	Conductus, cum vinis - - -	„
„		Will'o de Acra et Thoma de Gravenell.	Conductus, cum xx. servientibus -	„
„	Joh'i Marese' -	Ric'o de Samford -	Custodia forestæ de Chipham et de Melkesham.	x. Apr.
„	H. de Burgo, Justic' Angl'.	Hominibus morari volentibus in munitione castri Dovor.	De terris inimicorum Regis in Kantia conferendis, ad dictos homines sustentandos.	xiiij. Apr.
„	Falkes' de Breaute	H. de Burgo, Justic' Angliæ.	Quingentæ marcæ de hidagio et auxilio captis in comitatibus dicto Falkes' commissis.	„
„	Tenentibus de septem hundredis de Wald', &c.	Will'o de Casingham.	Septem hundreda de Wald' et Denni quæ pertinent ad manerium de Middelton, ad se sustentandum.	„
„		Ric'o le Bret -	Conductus in veniendo ad loquendum cum Com' W. Mar'.	„
„		Rogero de Alneto -	Conductus - - - - -	„
„	Ric'o fil' Rogeri -	Will'o Durc et aliis hominibus Emerici de Sassy de Berton.	Quod deliberentur a prisona - -	„
„		Steph'o de Croy -	Conductus cum mercandisis, &c. -	xij. Apr.
„		Isabella de Crevequer.	Conductus ad eundum usque Corf' ad loquendum cum Regin' de Cornhill viro suo.	„
8	Rob'to de Den et Will'o de Casingham.	Hominibus Archiepiscopi Cant' de manerio de Mauling.	Protectio si sint ad fidem Regis et cruce signati in pectore ad eundum cum Rege in subsidium Dei et Sanctæ Ecclesiæ.	„
„	Baronibus Hib'n' -	H. Dublin' Archiepiscopo.	Quod ei in omnibus quæ ad Regem spectant ordinandis et disponendis sint intendentes, una cum G. de Mar', Justiciario Hibern'.	xvj. Apr.
„	G. de Mar', Justic' Hib'n'.	„ „	Quod consilio dicti Archiepiscopi adquiescat.	„
„	„ „	„ „	Custodia episcopatus Leghelens' -	
„	Ph'o de Albun' -	Rege	Quod castrum Cicestr' dirui et prosterni faciat.	„
„		Will'o de Ipr' Clerico.	Conductus - - - - -	„
„		Adæ de Bontesham et Rogero de Gerdeleg.	„ - - - - -	„

No. 6.—Specimen Calendar of the Patent Rolls, 1 Hen. III.—*continued.*

Memb.	Quibus Missæ.	Pro Quibus.	Summarium.	Apud.
8		Rob'to de Paris' -	Conductus, cum mercandisis - -	Winton. xvij. Apr.
„	Petro de Maulay -	Henrico filio Comitis.	Redditio maneriorum de Dorecastr' et de Brideport et forestæ de Blakemore, sicut comes Regin' pater suus illa tenuit, et mercati de Milbourne, nisi Rad'us de Veteri Ponte illud habuerit de dono J. Regis.	„
	Burgensibus, &c. Dorecestr' et Brideport.	„ „	Quod ei sint intendentes - - -	„
„	Viridariis, &c. de Blakemore.	„ „	„ „ „	—
„	Hominibus de Mercato de Mileburn.	„ „	„ „ „	—
„		Thoma de Albo Monasterio.	Conductus in veniendo ad loquendum cum W. Com' Mar' de pace sua.	xviij. Apr.
„	Hominibus de Upaven'.	Lupillone Balistar'	Quod ei sint intendentes donec Petr' de Maulay ei satisfecerit de exitibus terræ Aluredi de Lincoln'.	„
„	Falkes' de Breaute	Militibus ad fidem Regis redire volentibus.	Saisina terrarum suarum, &c. - -	„
„	Hominibus de Chipham et Kinele.	Johanne Maresc' -	Manerium de Chipham et manerium de Kinele quod fuit Johannis filii Alani.	xx. Apr.
„	Joceo de Plugenay	Joppe filio Jocei de Wilton, Judæi.	Quod deliberetur et abire quietus permittatur.	xxj. Apr.
„	Ric'o filio Reg' -	Isaac filio Salamon', Judæo.	Quod deliberetur et mittatur ad Com' W. Mar'.	„
„	Civibus, &c. Cicestriæ.	Regina matre Regis	Redditio civitatis Cicestriæ pertinentis ad dotem suam.	„
„		Petro filio Hereberti.	Conductus - - - - -	„
„		Roberto de Novo Burgo.	„ - - - - -	„
„	W. Maresc', jun. -	Chera, Judæa Winton.	Quod deliberetur et permittatur venire usque Winton.	xxij. Apr.
	Galfr'o de Laurton et Franket, servientibus W. Mar'.	„ „	„ „ „ „	"
„		Petro Letart -	Conductus - - - - -	„
„	Ballivis, &c. -	Petro de Norton -	Pardonatio fugæ et utlagationis pro morte Thomæ de Mer' per finem x. marcarum.	xxv. Apr.
„		Rob'to de Abbendon	Conductus - - - - -	„
„	Omnibus - -	Rad'o Musard -	Quietantia de iiij^{xx} marcis argenti de comitatu Glouc' receptis in camera apud Winton.	xv. Apr.
„		„ „	Quientantia de xx. marcis - -	xxv. Apr.
„		Abbate de Cern' -	Quietantia de xij. marcis pacatis apud Winton, de fine facto pro servitio duorum militum.	„
„	Hominibus de Upavene.	Petro de Maulay -	Quod ei sint intendentes de manerio de Upavene.	„
„		Petro Letart et aliis in castro Winton.	Conductus in eundo usque London, &c.	„
„		Jocelino de Hispan'	Conductus - - - - -	xxvj. Apr.
„	Omnibus - -	Abbate de Abbodesbir'.	Quietantia de vj. marcis receptis apud Winton, de fine facto pro servitio militis	
	Tenentibus de Abb'ia Cirecestr'.	Waltero Celerario quondam Cirecestr'	Assensus ad electionem de eo factam in Abbatem Cirecestr'.	xxviij. Apr.
„		Ric'o de Stutecumbe	Conductus.	—
„		Odone de Woudestre, Gerardo de Brocton.	„	—
„	Olivero de Albun' -	Rege - -	Quod castrum de Porecestr' prosterni faciat.	xxvij. Apr.
„		Hugone Grosse et aliis in castro Merleberg.	Conductus in revertendo ad partes suas	Merleb. xxix. Apr.
„	Ph'o Marc' -	Agatha, uxore Will'i de Albun'.	Quod a prisona deliberetur, per obsides	„
„	Majori, &c. Bristoll'	Rege - -	Quod habere faciant Will'o Marescallo juniori, septem viginti libras in denariis vel mercandisis, de debito quod Regi debent.	Divis. iij. Maij.
„	Forestariis, &c. de Chipham et de Melkesham.	Johanne Marescallo, Constabul' castri Divis'.	Quod ei sint intendentes de foresta predicta, quam Rex assignavit ad sustentationem castri Divis'	v. Maij.
„		W. Comite Waren'	Conductus - - - - -	v. Maij.

No. 6.—Specimen Calendar of the Patent Rolls, 1 Hen. III.—*continued.*

Memb.	Quibus Missæ.	Pro Quibus.	Summarium.	Apud.
8	Militibus et aliis de episcopatu Sarum.	R. Cicestr' Episcopo	Custodia episcopatus Sarum - -	Oxon. ix. Maij.
	Thomæ de Arcy, Officiali Sarum, et Rad'o de Bray.	„ „	Saisina de episcopatu Sarum - -	„
	Omnibus - -	Abbate et Canonicis de Osen'.	Quietantia de L. marcis quas Abbas et monachi de S. Albano eis liberaverunt ad opus R. pro servitio militum Regi debito.	„
„	Ric'o filio Regis et aliis ballivis, &c.	Rad'o Harang' -	Conductus in eundo in nuntium Regis	x. Maij.
„	Gerardo de Rodes	Will'o Briwerr' -	Quod ei liberet Ernaldum filium Hermanni de Helslo, prisonem, ad deliberandum pro eo Will'um Gernun nepotem suum.	„
„		Ric'o de Forde -	Conductus in veniendo ad loquendum cum W. Com' Mar'.	„
„		Ph'o, persona de Newton.	„ „ „ „	„
„		Rob't'o filio Will'i de Aubeny, Hugone Ridel, Ric'o fr'e suo.	Conductus in eundo ad Will'um de Albun.	Newerc. xx. Maij.
7	H. de Vivon' -	Joh'e de Ken -	Quod deliberetur a prisona per plegios	Linc. xxiij. Maij.
„	Omnibus - -	Briano de Insula -	Custodia castri villæ, &c. de Cnaresburg' ad xiiij$^{\text{mum}}$ annum ætatis Regis.	„
„	W. Com. Sarr' -	R. Comite Cestr' -	Redditio castri de Monte Sorello -	„
„	Vic' Norf' - -	Rogero la Zuche -	Cossteseye, quæ fuit Vic' de Roham -	„
„	Vic' Cantebr' -	„ „	Terra de Fuleburn et de Swaneseye, quæ fuerunt Vic' de Roham.	„
„	Omnibus - -	Phil' Marc' -	Terra Oliveri de Aencurt - -	xxiiij. Maij.
„	Ballivis, &c. -	W. Comite Sarr' -	Custodia civitatis et comitatus Lincoln'	—
„	Militibus, &c. -	„ „	Quod ei sint intendentes - -	„
„		Gerardo Talebot -	Conductus in veniendo ad loquendum cum W. Com' Mar'.	„
„		Jacobo de Valle Badon.	Conductus - - - - -	Graham. xxv. Maij.
„		Margareta, uxore Rob'ti Gresley.	Conductus in eundo de Linc' versus partes suas.	Linc. xxv. Maij.
„		Joh'e le Bel et Daniel serviente Roberti filii Walteri.	Conductus in eundo ad redemptionem suam perquirendam.	Stamford. xxv. Maij.
„	Militibus et aliis de Sumerton.	Willielmo de Torinton.	Manerium de Sumerton ad se sustentandum.	„
„		Priore, &c. Hospital' Linc'.	Protectio - - - - -	Graham. xxv. Maij.
„		Abbate et conventu de Swinesheved.	„ - - - - -	„ Geytinton.
„	Ph'o Marc' -	Nicholao de Albun'	De Agatha Trussebut uxore sua ei liberanda, per obsidem.	xxvj. Maij.
		Hillar' Trussebut -	Conductus - - - - -	„
„	Vic' Linc' - -	Simone Trussebut et R. Clerico.	Custodia escactarum et terrarum inimicorum Regis.	xxvij. Maij.
		Rob'to de Pinkeney	Conductus in veniendo ad loquendum cum Com' W. Mar'.	Norht. xxviij Maij.
		Alano de Hida -	Conductus - - - - -	„
		Hug' de Cahaynes	Conductus in eundo ad perquirendam redemptionem.	Brakel. xxix. Maij.
„		Joh'e de Appelford	Conductus in veniendo ad loquend' cum Com' W. Mar'.	Oxon. xxxj. Maij.
„		Waltero de Essceg'	„ „ „ „	„
„		Hugone de Malo Alneto et Rad'o Pluket.	Conductus - - - - -	„
„		Fratribus Domus S. Lazari Irl'm in Angl'.	Protectio, &c. - - - -	„
„	Linc' Episcopo -	Johanne de Northfeld.	Præsentatio ad ecclesiam S. Joh'is Bapt' in Oxon'.	ij. Jun.
„		Waltero de Essceg'	Conductus ad veniend' Oxon' ad loquendum cum H. Comite Hereford.	„
		Michaele Belet -	Conductus in veniendo ad loquendum cum com' W. Mar'.	„
„		Johanne Constab' Cestr'.	Conductus - - - - -	Rading. vj. Maij.
„		Thoma de Nevill -	Conductus in veniendo ad Com' -	„
„		Henr' de S. Walerico	Conductus - - - - -	„
„		Joh'e de Bonewell	„ - - - - -	„
„		Joh'e filio Ric'i -	„ - - - - -	„
		Hugone de Sc'o Vedasto.	Conductus in veniendo ad Com' W. Mar'	„

No. 6.—Specimen Calendar of the Patent Rolls, 1 Hen. III.—*continued.*

Memb.	Quibus Missæ.	Pro Quibus.	Summarium.	Apud.
7		Episcopo Turonensi, C. Cisterciens', G. Pontin', W. Clarevall Abbatibus.	Conductus in veniendo in Angliam -	Reading. vj. Junij.
„		Matil' de Dine -	Protectio - - - - -	„
„	Petro de Maulay -	Roberto Marmiun primogenito et Roberto de Ufferes.	Potestas se transfretandi cum hominibus, equis, &c.	Certesey. vj. Junij.
„		Comite Nivericensi et Comite Britann'	Conductus, &c. - - - -	viij. Junij.
„	Rob'to de Gaugy -	H. Lincoln Episcopo.	Redditio castri Newerc' cum pertinentiis.	x. Junij.
„	Will'o de Albun' -	„ „	Redditio castri de Lafford - -	„
„	Omnibus - -	Joh'e de Crey -	Conductus et protectio pro nave sua cum vinis, &c.	„
„	Hominibus de Petrefeld et de Mapeldurcham.	Rogero la Zuch -	Manería de Petrefeld et de Mapeldureham, habenda quamdiu Regi placuerit	xj. Junij.
„		Hamone de Crevequoer.	Conductus ad veniendum ad loquendum cum Com' W. Mar'.	„
„	W. Com' Aubemarl et ballivis, &c.	Will'o de Cantilupo seniore.	Quod se non intromittant de terra, &c. dicti Willielmi in com' Leirc' quem Rex ei commisit custodiendum.	x. Junij.
„	Omnibus de com' Suhamt'.	Johanne Maresc' -	Custodia com' Suhamt' cum civitate Winton, burgis, et aliis pertinentiis.	„
6	Ballivis, &c. -	Quatuor magnatibus de consilio Domini Lodovici.	Conductus ad veniendum inter Breynford et Hundeslawe ad loquendum cum quatuor magnatibus de consilio Regis.	xij. Junij.
„		Militibus et aliis in castro de Bulcsov'r.	Conductus ad veniendum ad Falkes' de Breaute.	„
„		Agnete, uxore Ric'i de Muntfichet.	Conductus - - - - -	„
„	Omnibus - -	Thoma de Multon -	De cc. marcis argenti receptis de redemptione dicti Thomæ.	„
„		Milicent de Muntfichet.	Conductus - - - - -	„
„	Vic Lincoln' -	Waltero de Verdun, Simone Trussebut, et Ric'o Clerico.	Custodia excaetarum in comitatu Lincoln.	„
„		W. Comite Arundell, P. filio Herberti.	Conductus in veniendo ad Com' W. Marescal.	Stanwell. xv. Junij.
„		Radulpho de Stretford.	„ „ „ „	„
„	Tenentibus de manerio de Hertelegh.	Petro de Bosco -	Manerium de Hertelegh, quod fuit Rob'ti Maudut, ad se sustentandum.	xviij. Jun.
„	Tenentibus de manerio de Greywell.	„ „	Manerium de Greywell, quod fuit Gilberti de Aquila.	„
„	H. de Burgo, Justic' Angl'.	Ricardo filio Regis	Castrum de Chileham - - -	xxj. Junij.
„		Tyrrens' Archiepicopo, Abbatibus Cisterciens' Clarevall et Puntinny.	Conductus in eundo ad mare et inde revertendo.	„
„	Galiotis, &c. in partibus de Lenn'.	Hominibus de Lenn'.	De protectione quamdiu fuerint ad fidem et servitium Regis.	Certes'. xxij. Junij.
„	Ph'o de Ulecot -	W. Com' Warenn' -	Quod navis hominum suorum, et homines sui deliberentur, quia venit ad fidem Regis.	„
„	Rob'to de Gaugy -	H. Episcopo Lincoln.	De castro de Newerk ei sine dilatione deliberando.	xxiij. Jun.
„	Gerardo de Furnivall.	Roberto de Veteri Ponte.	Quod ei liberet castrum de Bolesovres -	„
„	Rob'to de Veteri Ponte.	W. Comite de Ferrar.	Quod castrum supradictum ei liberet -	„
„	Tenentibus de manerio de Hadfeld.	Will'o de Casingham.	Manerium de Hadfeld ad se sustentandum.	„
„	Ph'o Marc' -	Comite W. Maresc'	Quod ei mittat Hermannum de Herslo obsidem pro Comite de Los.	„
„	G. de Maresc' -	Regin' de Brausa -	Custodia castri et civitatis Limeric ad quartum decimum annum ætatis Regis, quia venit ad fidem Regis.	xxiiij. Jun.
„	Henr' filio Com' -	„ „	Quod ei habere faciat castrum suum de Totencss'.	„
„	Henr' de Trascy -	„ „	De castro de Barnestapl', ut supra -	„
„	Tenentibus de terris, &c. W. de Braus' in Angl'.	„ „	Redditio terrarum et ten. quæ fuerunt W. patris sui.	Stanwell. xxiiij. Jun.

No. 6.—Specimen Calendar of the Patent Rolls, 1 Hen. III.—*continued.*

Memb.	Quibus Missæ.	Pro Quibus.	Summarium.	Apud.
6	Tenentibus ut supra, in Hib'n.	Regin' de Brausa -	Redditio terrarum, &c. quæ fuerunt W. patris sui in Hib'n.	Stanwell. xxiiij. Jun
„	G. de Mar', Justic' Hib'n'.	„ „	Saisina de castris, terris, &c. in Hibernia.	xxiij. Junij.
„	Omnibus - -	B. Regina - -	Ratificatio conventionis factæ inter eam et J. Regem super dote sua.	„
„		Will'o de Greynvill	Conductus ad veniendum ad loquendum cum Com' W. Mar'.	„
		Rob'to de Colevile -	Conductus ad eundum ad Robertum filium Walteri.	„
„		Lucia, uxore Thomæ de Arden'.	Conductus ad eundum ad loquendum de fine domini sui.	„
„		Matilda, uxore Will'o de Colevile.	Conductus ad eundum ad perquirendum redemptionem viri sui.	„
„		Springot le Bretun	Conductus in eundo per Angliam ad negotiandum.	xiiij. Jun.
„		Isabella, uxore Rogeri de Cressy.	Conductus in eundo ad perquirendum deliberationem viri sui.	xxvj. Jun.
„	G. de Marisc', Justic' Hib'n'.	Nicholao de Verdun	Saisina de dimidio cantredi de Ponte Ferardi.	Rading. xxvij. Jun.
„	„ „	„ „	Redditio castri de Dundalc' - -	„
„		Nich'o de Withleg'	Conductus - - - - -	„
„		Rogero de Aencurt	„ - - - - -	„
„		Joh'e de Escufeld -	Conductus in veniendo ad Com' W. Mar'.	„
„	Tenentibus de honore de Berdestaple.	Regin' de Brewes -	Quod ei sint intendentes de honore de Berdestaple.	„
„	Tenentibus de honore de Tottenеis.	„ „	Ut supra de honore de Totteneis -	„
„	Tenentibus et aliis de episcopatu Cicestr'.	R. Sarum Episcopo	Custodia episcopatus Cicestr' - -	„
„		Illis qui ad fidem Regis veniant per W. de Albiniac'.	Conductus in veniendo ad loquendum cum W. Comite Mar'.	Oxon. xxix. Jun.
„	Comitibus et aliis de com' Sutht'.	P. Winton Episcopo	Custodia castri Winton et comitatus Sutht'.	„
„	W. Com' Sarr' -	Obsidibus datis de castro Winton Regi reddendo.	Quod liberentur, et conducentur salvo, donec venerint in potestatem Domini Lodovici.	„
„	Ballivis - -	W. Maresc', jun' -	Quod eum permittat in pace tenere terras quæ fuerunt S. Com' Winton et Com' David.	„
„	„ „	Will'o de Casingham.	Quod se non intromittant de prisonibus seu lucris, &c. quæ ipsum Will'm contingunt.	„
„		Thoma de Muleton	Conductus in eundo ad perquirendum redemptionem.	„
„	Ph'o de Ulecot, Cust' episcopatus Dunolm'.	R. de Maresc' in ep'um Dunolm' confirmato.	Castra Dunholm' et de Norham et episcopatus Dunholm.	„
„	Tenentibus de episcopatu Dunolm.	„ „	Quod ei sint intendentes - -	„
„	Tenentibus de episcopatu Dunolm' in com' Linc'.	„ „	„ „ - -	„
„	Galfr'o de Nevill -	„ „	Manerium de Hovendene - -	„
„	Tenentibus de manerio de Hovendene.	„ „	Quod ei sint intendentes - -	„
„	Falkes' de Breaute	Laurentio clerico Legati, rectore ecclesiæ de Cestreton.	Redditus quem tenentes de ecclesia de Cestreton Regi reddere solebant, ad quartum decimum annum ætatis Regis.	„
5		Rob'to Marmion, jun'.	Conductus ad veniendum ad loquendum cum Comite W. Mar'.	Glouc. i. Julij.
„	Omnibus - -	R. Dunolm' Episcopo Cancellario.	Potestas recipiendi ad fidem Regis, &c.	ij. Julij.
„	„ - -	Ebor' Archiepiscopo	„ „ „	„
„	G. de Marisc', Justic' Hib'n'.	Waltero de Lascy -	Castra de Drogheda et Airmaill cum castris, &c. quæ fuerunt Ric'i de Tuit.	„
„	H. Dublin' Archiepiscopo et Baronibus Hib'n'.	„ „	Quod sint consulentes G. de Marisco ad faciendum mandatum de castris, &c. supradictis.	vj. Julij.
„	Omnibus - -	P. Winton Episcopo	Custodia comitatus Suthamton -	„
„	Vic' Oxon' et ballivis.	A. Abbate de Einesham.	Licentia viam transferendi in Einesham.	iij. Julij.
	Com' Sar' - -	Obsidibus pro castro Winton Regi reddendo.	Conductus - - - -	iiij. Julij.

No. 6.—Specimen Calendar of the Patent Rolls, 1 Hen. III.—*continued.*

Memb.	Quibus Missæ.	Pro Quibus.	Summarium.	Apud.
6		Nicholao de Chavincurt.	Conductus ad veniendum ad Com' -	Glouc. iiij. Julij.
5		Thoma de Gravenell	Conductus veniendo Glouc' ad loquendum cum Gilberto de Clar'.	Cast' Goderich. iiij. Julij.
„		Waltero de Esseleg	Conductus ad perquirendum pacem suam.	Strigoil. vij. Julij.
„	Petro de Maulay -	Will'o de Lungesp', Com' Sarr'.	De ingressu et egressu in castrum de Corf.	ix. Julij.
„		Matilda, uxore Comitis Hereford.	Conductus - - - - -	„
„		Roberto, clerico de Hakinton.	„ - - - - -	x. Julij.
„	Ballivis - -	Rob'to de Kirketon et Ivone Arsik, Militibus Rob'ti de Huntingfeld.'	Conductus in eundo London, redeundo, &c.	Usk. vij. Julij.
„	H. de Burgo, Justic' Hib'n'.	Ada filio Will'i -	Saisina de terris suis, quia venit ad fidem Regis.	Glouc. xiiij. Julij
„	Falk' de Breaute -	„ „	„ „ „ „	„
„	W. Burdegal' Archiepiscopo.	Rusteng' de Solar'	Castrum de Barrera, cum honore, &c., ad se sustentandum.	iij. Julij.
„		Steph'o de Croy -	Conductus, ad negotiandum - -	„
„		Will'o de Legh, Milite.	Conductus in veniendo ad Comitem W. Maresc'.	Oxon. xx. Julij.
„		Rob'to de Chastyllons et Rad'o Capellano, Militibus Galfridi de Say.	Conductus in eundo London pro obsidibus, &c. dicti Galfridi.	„
„		Ric'o de Percy -	Conductus in eundo ad loquendum cum Lodovico.	Striguil. xx. Julij.
„		Abbate de Alba Landa.	Conductus in eundo versus capitulum Cicestr'.	„
„		Will'o de Bosco -	Conductus in veniendo ad Com' W. Maresc'.	Oxon. xxiij. Jul.
„		Gerardo de Favencurt.	„ „ „ „	„
„		Rogero de Aencurt	„ „ „ „	„
„	Archiepiscopis et aliis de com' Warwic' et Leirc'.	Will'o de Cantil' seniore.	Custodia comitatuum Warwici et Leirc'	„
„	Ph'o de Ulecot -	R. Dunolm' Ep'o Cancellario.	De saisina de episcopatu Dunolm' cum castris, &c.	„
„	Rob'to de Gaugy -	H. de Colevill -	De castro de Newerc' ei liberando -	„
„		Ric'o Piret - -	Conductus - - - - -	xxiiij. Jul.
„	Rob'to de Den' -	Rege - -	Quod non permittat se dissaisiri de terris inimicorum Regis per guerram occupatis.	„
„		Galfr'o Gilliwine	Conductus - - - - -	„
„		Isabella de Cressy -	„ - - - -	„
„		Thoma Daneis -	Conductus ad eundum ad perquirendum redemptionem.	„
„		Eudone Arsic' -	„ „ „ „	„
„	Tenentibus de honore de Raleg'.	H. de Burgo, Justic' Angliæ.	Honor de Raleg' quamdiu, &c. - -	„
„	Tenentibus de honore de Haghenet.	„ „	Honor de Haghenet - - -	„
„	Viridariis, &c. forestæ de Harestan.	Roberto de Ferrar'	Custodia forestæ de Harestan - -	„
„		Will'o de Bosco -	Conductus - - - - -	Glouc. xxv. Julij.
„		Joh'e de Esefeld -	„ - - - - -	„
„		Steph'o de Crey -	Conductus, cum rebus, &c. - -	„
„		Roberto - -	„ „ - -	„
4	Omnibus - -	Thoma de Muleton	De c. marcis de redemptione sua receptis in garderoba.	xxviij. Jul.
„	Dec' et Cap'lo Cicestr'.	Decano et Capitulo Cicestr'.	Licentia eligendi episcopum - -	Oxon. xxiiij. Jul.
„		Ric'o filio Artur' -	Conductus in eundo ad redemptionem suam perquirendam.	vij. Aug.
„		Rogero de Bernevall.	Protectio - - - - -	„
„		Waltero de Clinton	Conductus - - - - -	viij. Aug.
„		Matilda, quæ fuit uxor Jacobi de Novo Mercato.	Conductus in veniendo ad com' -	ix. Aug.
„	Rob'to de Cortenay	I. Regina matre Regis.	Stannaria comitatus Devon, cum cuneo, &c.	„
„	Tenentibus de ab'ia de Grimesby.	Ric'o Priore de Sned.	Assensus ad electionem ejus in Abbatem de Grimesby.	x. Aug.

No. 6.—Specimen Calendar of the Patent Rolls, 1 Hen. III.—*continued.*

Memb.	Quibus Missæ.	Pro Quibus.	Summarium.	Apud.
4		Waltero de Soureby, Ada Persona de Cotingeham.	Conductus - - - - -	Oxon. x. Aug.
„		Reymundo de Perille, mercatore de Navare.	Conductus ad negotiandum, &c. -	„
„	G. de Marisc', Justic' Hib'n'.	Will'o filio Johannis.	Quod ei habere faciat terram suam de Crumelin.	
„	Tenentibus de honore Lanc'.	R. Com' Cestr' -	Custodia honoris Lanc', cum pertinentiis.	„
„	Vic' et ballivis -	„ „ „	Quod se non intromittant de terris de honore Lanc'.	„
„		Will'o de Essetford	Conductus in veniendo ad Com. W. Maresc'	xj. Aug.
„		Rob'to Marmiun, jun'.	„ „ „ „	„
„		Rogero de Montebegouis.	„ „ „ „	„
„	W. de Albiniac' -	Thoma de Muleton	Saisina de domo sua de Muleton, cum terris, &c.	„
„		Osberto Arsic' -	Conductus in eundo ad perquirendum redemptionem suam.	xiij. Aug.
„	Rob'to de Gaugy -	H. Lincoln' Episcopo.	De castro de Newerc' ei reddendo -	„
„		Matilda de Breuse	Conductus - - - - -	„
„	Tenentibus de terra com' Glouc'.	H. de Burgo, Justic' Angl'.	Terra Comitissæ Glouc', cum feodis, &c.	„
„	Regin' de Pontibus	Isabella, Regina Angliæ.	Custodia castri de Melpius - -	„
„	Burdeg' Archiepiscop.	„ „	„ „ „ - -	„
„	Ph'o de Ulecot -	R. Dunolm' Episcopo.	Episcopatus Dunelm', cum castris et aliis pertinentiis.	„
„	Clero Armichanæ eccl'iæ.	Luca Archidiacono Armicanæ ecclesiæ	De electione ejus, modo indebito, in Archiepiscopum Armichanæ ecclesiæ	„
„	Tenentibus de honore de Eya.	Falkes' de Breaute	Custodia honoris de Eya - -	„
	Tenentibus de manerio deGum ecestr'.	„ „	Custodia manerii de Gumecestr' -	„
„		Jacobo de Valle Badon.	Conductus - - - - -	„
„	Petro de Maulay -	W. Comite Sar' -	Saisina de comitatu Somerset - -	Rading. xiiij. Aug.
„	Comitibus et aliis de com' Somer's.	„ „	Quod ei sint intendentes - -	„
„	Rob'to de Curten	W. Comite Sarr' -	Saisina comitatus Devon salva Reginæ dote sua.	„
„	Omnibus - -	„ „ „	Quod ei sint intendentes - -	„
„	Falk' de Breaut' -	Rog' la Zuche -	Maneria de Fuleburn et Suanes' in excambium terræ suæ de Britan'.	„
„		Michael de Puninges.	Conductus - - - -	Lewes. xvij. Aug.
„		Petro, clerico Templi.	„ „ - - - - -	Rumenel. xix. Aug.
„		Rad'o de la Bruwere.	Conductus in veniendo ad loquendum cum Com. W. Mar'.	„
„		Joh'e fil' Hug' -	Conductus - - - - -	Cant. xxiij. Aug.
„		Mercatoribus de Havreford.	Conductus ad negotiandum, &c. -	„
„	Baronibus de Quinque Port'.	Baronibus de Quinque Portubus.	Quod illi qui spoliaverunt inimicos Regis in mari habeant de lucro, &c.	Sondwiz. xxv. Aug.
„	Ballivis, &c. -	Hugone Bauleford	Conductus ad negotiandum - -	xxvij. Aug.
„	„ „ „	Thoma de Reminges.	Custodia terrarum et hæred' Joh'is de Northye cum maritagio hæred'.	„
„		Alex'o fil' Ric'i de Dunewich.	Conductus ad negotiandum, &c. -	„
„		Rad'o filio Bernardi.	Conductus in eundo ad loquendum cum Comite W. Mar'.	Cant. xxx. Aug.
„		Petro de Hasting -	Conductus cum galia - - -	
„	Omnibus - -	Ph'o de Albiniac' -	Protectio pro navibus in insulam de Geres' euntibus cum gente dicti Philippi.	Sandwich. xxviij. Aug.
„	Vic' Kanc' -	Abb'e S. Aug' de Cant'.	Quod habeat consuetudines suas in hundredo de Middelton et alibi.	Cant. xxxj. Aug.
3	Baronibus de Quinq' Portubus.	Rege - - -	Quod cum toto navigio veniant in servitium Regis in Tamisiam.	j. Sept.
„	Ballivis, &c. -	Incolis de Dunewich.	Protectio pro illis qui tenseriam acciperint.	„
„		Nicol' de Anestye	Conductus in veniendo ad loquendum cum Com' W. Mar'.	„
		Ph'o et Will'o de Columbers.	Conductus.	—

No. 6.—Specimen Calendar of the Patent Rolls, 1 Hen. III.—*continued.*

Memb.	Quibus Missæ.	Pro Quibus.	Summarium.	Apud.
3		Waltero Overal -	Conductus - - - - -	Certes. vij. Sept.
„		Marmaduc' de Twenge', Robt'o de Menell, Engel' de Boninton.	„ „ - - -	„
„		Herberto Le Francois.	Conductus ad negotiandum, &c. -	„
„		Matilda, uxore Hugonis Bygod.	Conductus - - - -	„
„		Eudone Arsic, Ph'o de Snaringes.	Conductus in eundo ad perquirendum redemptionem Will'i de Huntingfeld.	ix. Sept.
„		Margar', uxore Elyæ de Lungvil.	Conductus in veniendo ad loquendum cum Comite W. Marescl'.	„
„	Archiepiscopis et aliis de com' Norf' et Suff'.	Huberto de Burgo, Justic' Angl.	Custodia comitatuum Norf' et Suff' -	x. Sept.
„	Ph'o de Ulecot -	Rogero Bertram et suis.	De saisina habenda de castris, terris, &c.	xj. Sept.
„		Thoma de Clyvill -	Protectio - - - -	x. Sept.
„		Ada de Bendeng -	Conductus in veniendo ad Com' W. Mar'	xij. Sept.
„	W. Briwer, jun. -	Vic' Suhampt' -	Custodia castri de Carebroc, quod fuit W. Com. de Insula mortui.	„
„	R. Com' Cestr' -	Johanne de Fossa	Quod a prisona deliberetur secundum formam pacis inter Regem et Ludovicum.	Kingeston. xiiij. Sept.
„	Majori, &c., London	Ludovico Regis Franciæ primogenito.	Quod ipse et sui defendantur et custodiantur, pace reformata, &c., ut supra.	„
„	Baron' et aliis de terra quæ fuit Com' W. Devon.	Henr' de Ponte Audemar et Rad'o de Norwic'.	Custodia terrarum quæ fuerunt dicti Comitis, exceptis terris in Com. Suth'.	xv. Sept.
„	Vic' et ballivis -	„ „ „	Saisina de terris supradictis - -	„
„	Regin' de la Werth' Constab' de Plinton.	„ „ „	Quod castrum de Plimton, quod fuit dicti comitis, eis liberet.	„
„	Archiepiscopis, &c. de com' Sussex.	Math' filio Hereb'	Custodia com. Sussex - - -	„
„		Petro Estugun -	Conductus - - - - -	„
„		Will'o de Bidingdon.	Conductus in eundo usque London -	xvij. Sept.
„	R. de Clifford -	Comitissa Glouc' -	Redditio domus et terræ suæ in Henlea	
„	Petro de Maulay -	„ „ „	Saisina de terris suis, &c. - -	„
	Tenentibus de Comitissa Glouc'.	„ „ „	Quod ei sint intendentes (quia venit ad fidem Regis).	„
„	Constab' de Meauton, Rad'o de Bray, Olivero filio Regis, et Ric'o fil' Hugon'.	Ludovico Regis Franciæ primogenito.	Quod ei nullum damnum faciant in partibus Norf', Suff', Essex, et Hertford (pace firmata inter Regem et dictum Ludovicum).	Mereton. xix. Sept.
„	Omnibus - -	Alano Basset -	Conductus in conducendo S. Com. Winton ad consilium Regis.	„
„	W. Archiepiscopo Ebor', R. Episcopo Dunolm', R. Com. Cestr', et aliis.	Roberto de Veteri Ponte.	Quod, nisi Rex Scotiæ reddidit dicto Roberto castrum de Karliol, et terras quas occ'one guerræ inter Regem et Dominum Ludovicum habitæ, occupavit; dicto Roberto auxilium impendant ad recuperandum castrum et terram supradictæ.	Westm. xxiij. Sept.
„	Omnibus - -	Ada Vic' Moled' Gilon' nepote ejus et sociis.	Conductus, donec dictus Vic', qui infirmabatur, convaluerit.	„
„		Math' de Abbetot et Jordano de Berengevill.	Conductus - - - -	„
„	A. Regi Scot' -	R. de Veteri Ponte	Quod ei liberet castrum de Karliol', prisones, terras, &c.	„
„	Alano de Galweya, Const' Scot'.	„ „ -	„ „ „ „	„
„	Archiepiscopis, &c., de com. Cumbr'.	„ „ -	Custodia castri Karliol' et Comitatus Cumbr'.	„
„	Majori, &c., London	Regina matre Regis	Saisina de Riparia Reginæ, quæ est de dote sua.	„
„	Omnibus - -	Johanne de Ely -	Conductus cum mercandisis - -	Lambeye. xxiij. Sept.
„	„ - -	Will'o de Bello Monte Mar' Domini Ludovici.	Conductus in eundo per potestatem Regis cum obsidibus, &c.	„
„	Hominibus de Norwic', Dunwic', Gernem', Lenn', &c.	„ „ „	Quod ei satisfacient de debitis quæ dicto Ludovico debent.	„

No. 6.—Specimen Calendar of the Patent Rolls, 1 Hen. III.—*continued.*

Memb.	Quibus Missæ.	Pro Quibus.	Summarium.	Apud.
3	Tenentibus, &c., de honore de Haye.	Godefr' de Luvern'	Quod ei sint intendentes - -	Lamheye. xxiij. Sept.
„	Will'o de Bello Monte.	Com' W. Mar' -	Quod ei liberet chartas, &c., quæ habet de Ysaac de Norwic' et aliis Judæis.	„
„		Ysaac de Norwico, Judæo.	Conductus - - - -	„
„		Comite David -	Conductus - - - -	„
„	Burdegal' Archiepiscopo.	W. Com. de Albemarl'.	Custodia terræ et hæredis Ernoldi de Forez in Lulay.	„
„	Rob'to de Veteri Ponte.	R. Comite Augy -	Quod ei liberet castrum suum de Tykehull.	„
„	„ „ „	Warino filio R. Comitis Augy.	„ „ „ „	Cant. xxx. Sept.
„	Petro de Maulay -	Regin' de Cornh' -	De obsidibus suis deliberandis -	Gillingh. xxv. Sept.
„	„ „ -	Joh'e de S. Leodegario.	„ „ „ -	„
„	„ „ -	Joh'o Mautravers -	Quod deliberetur a prisona cum socio suo, &c.	Cant. xxvj. Sept.
„	Majori, &c., London	H. de Burgo, Justic' Angl'.	Cuneum et excambium London -	Ewell. xxviij. Sep.
„	Stefano Crabbe -	Comite Britann' -	Quod homines sui deliberentur -	„
„	Baronibus de Quinq' Portubus.	Prisonibus - -	Quod deliberent prisones secundum formam pacis factæ inter Regem et Ludovic'.	Dovr. xxix. Sept.
„		Rob'to de Bello Monte.	Conductus - - - -	„
„		Joh'o de Muntiniaco	„ - - - -	„
„	Falk' de Breaute -	Prisonibus - -	Quod deliberentur, &c. - - -	„
„	G. de Nevill' -	R. Com' Augi -	Saisina de terris suis - - -	„
2	W. Com' Aubemarl'	Roberto filio Walteri.	Quod cum deliberet secundum formam pacis inter Regem et Ludovicum filium Regis Franciæ reformatæ.	Cant. xxix. Sept.
„		Waltero de Dunstanville et Joh'e filio Alani.	Conductus - - - -	Lameth. ij. Oct.
„	Falk' de Breaute -	Osberto filio Nigelli	Quod cum deliberet secundum formam pacis, &c.	„
„		Odone de Puncy, Milone de Marcheis.	Conductus - - - -	„
„	Ballivis, &c. -	Abbate de Bello -	Protectio pro hominibus, rebus suis, &c.	iij. Oct.
„		Walo, serviente Hug' de Malo Alneto.	Conductus - - - -	„
„	Hominibus de Cestrehunte.	Comite Britann' -	Quod nulli nisi attornato dicti Comitis sint intendentes.	„
„	Comiti de Clare -	Thoma de Don -	Quod cum deliberet secundum formam pacis, &c.	„
„	Ballivis, &c. -	Rob'to de la Mare et Thoma de Winton.	Custodia terrarum et tenementorum quæ fuerunt Will'i de Lamalay.	„
2	Constabul' Norwic'	Isaac Judæo Norwic' et aliis Judæis.	Protectio, defensio, &c. - - -	„
„	Will'o Maresc', juniori.	S. Com' Winton -	Saisina de terris suis quas habuit die quo recessit a fide Regis.	iiij. Oct.
„	Ballivis, &c. - -	„ „ „	Quod de terris supradictis se non intromittant.	„
„	Ph'o de Ulecot -	R. Dunolm' Episcopo.	Quod ei liberet castra sua de Norham' et Dunolm'.	Westm. „
„	Rob'to le Sauvage	Will'o Reyne, mercatore.	Quod dictum Will'um captum per gentes castri de Brembr' deliberet.	„
„	W. Com' Warenn' -	Rogero de Horn et Ric'o filio suo.	Quod eos deliberet - - -	Lameth. v. Oct.
„	Falk' de Breaute -	W. de Mandevill -	De saisina terrarum quæ fuerunt G. de Mandevill fratris sui.	Westm. v. Oct.
„	W. Com' Albemar' -	Rob'to filio Walteri.	Quod cum deliberet secundum formam pacis, &c.	„
„		Gileb' de Gant' -	Quod cum deliberet per obsides usque ad concilium (a die S. Mich. in tres septimanas).	„
„	Omnibus de foresta Essex.	Ric'o de Muntfichet.	Quod ei sint intendentes sicut fuerunt die quo a fide Regis recessit.	vj. Oct.
„	Abb'i de Waltham -	Reginamatre Regis	Quod ei sit intendens de firma manerii de Waltham.	„
„	Tenentibus et aliis de villa de Writell.	Ph'o de Albun' -	Villa de Writell ad se sustentandum -	„
„	Civibus Linc' -	Will'o, nepote Gwarner'.	Quod sit Major civitatis Linc' sicut tempore Regis Joh'is.	„
„	Falk' de Breaute -	Filio et hærede Henr' de Braybroc.	Quod cum deliberet secundum formam pacis, &c.	„

No. 6.—Specimen Calendar of the Patent Rolls, 1 Hen. III.—*continued.*

Memb.	Quibus Missæ.	Pro Quibus.	Summarium.	Apud.
2	Santon' Episcopo -	Rege - -	Quod fidelitatem Regi debitam faciat coram Burdegalensi Archiepiscopo.	Lam. vj. Oct.
„	G. de Marisc', Justic' Hib'n'.	H. Dublin' Archiepiscopo.	Quingentæ marcæ de exitibus Hib'n', pro expensis suis in concilio generali in curiâ Romana.	„
„	„ „ „	„ „ „	Quod in recompensatione dampnorum ecclesiæ suæ, occasione castri Dublin firmati, habeat ad xiiij^{m} annum ætatis Regis terras quas tenuerunt Hertah et Gilby Ohmochan.	vij. Oct.
„	Hominibus de Lenn'.	Roberto filio Swynolf.	Quod et tanquam Majori suo sint intendentes, sicut tempore J. Regis.	„
„	Tenentibus de manerio de Kingeshatfeud	Will'o de Cassingh'	Manerium de Kingeshatfeud ad se sustentand'.	Westm. viij. Oct.
„	Petro de Maul' -	Joh'e Mautravers et Ric'o Burdun.	Quod eos deliberet - - -	„
„	Will'o deCassingh'-	Galfr'o Tresgoz -	Quod eum deliberet secundum formam pacis, &c.	„
„	Militibus et aliis de com' Linc'.	Simone Trussebut et Ric'o Clerico.	Soka de Geyton quamdiu R. placuerit	ix. Oct.
„	Thomæ filio Bernard' et Will'o de Bosco.	Will'o de Regat -	Quod eum deliberent secundum formam pacis, &c.	„
„	Hominibus de balliva Fulconis de Lisuris.	H. de Nevill -	Custodia ballivæ quæ fuit Fulconis de Lisuris in Foresta Regis.	viij. Oct.
„	Galfr'o de Nevill Camerario.	Steph'o de Croy et aliis mercatoribus Franciæ.	De coriis et lanis suis captis per marinellos Dunwic et ductis usque Scardeburg eis restituendis.	ix. Oct.
„	W. Com' de Alba Mar'.	Mercatoribus Franciæ.	De bladis captis apud Heddon eis restituendis.	—
„	Ph'o de Ulecot -	Steph'o de Croy -	De pecunia ab eo capta inter Pontem Fractum et Danecastr' ei restituenda.	—
„	Rob'to de Curtenay	„ „ „	De vinis captis apud Oxon. ei restituendis.	—
„	Ph'o de Albin' -	„ „ „	De frumento capto apud Ryam ei restituendo.	—
„	Rob'to de Veteri Ponte, G. de Nevill', Ph'o de Ulecot,et Briano de Insul.	Ric'o de Percy, Rogero de Monte Begon', Gileb filio Reinfr,' et Ad' de Stafleg'.	Conductus in veniendo ad loquendum cum W. Marescall, Comite Pembrok, de pace sua.	Lambeth o x. Oct.
„	Gileb' filio Reinfrid', Rogero de Monte Begon', Ric'o de Percy,et Adæ de Stafleg.	„ „ „	„ „ „ „ „	„
„		Rohero Cognato H. Regis Norwag'.	Conductus in morando in potestate Regis.	„
„	Henr' de Trascy -	Roberto de Carten', L. Comitissæ Leirc'	Quod eum permittat habere in pace balli'am suam in com' Devon'. Et quod dictæ comitissæ habere faciat maritagium suum quod ab ipsa detinet.	ix. Oct.
„	Henr' filio Com' -	Roberto de Curten'	Quod eum permittat habere in pace ballivam suam de comitatu Devon.	„
„		Regin' de Brayosa	Redditio castri sui de Tautois -	„
„		Waltero de Lacy et Henr' de Aldidelei.	Conductus pro illis quos secum ducunt London ad fidem et servitium Regis.	„
„	Falk' de Brewt' -	Johanne de Huntingfeld.	Quod eum deliberet per manucaptores	„
„		Will'o filio Benedicti et Ric'o de la Barre, &c.	Conductus ad negotiandum, &c. -	Westm. xij. Oct.
1	Hominibus de Basingstok.	Luca de Drimar' -	Manerium de Basingstok ad se sustentandum.	„
„		Baronibus London	Protectio, conservatio libertatum, &c. -	iiij. Oct.
„	Ballivis, &c. -	Mich' de Watevill	Conductus in eundo ad negotiandum, &c.	Lamch'. xiij. Oct.
„	Simoni de Chenduit et Will'o fratri ejus.	Alex'o Galun -	Quod eum deliberent secundum formam pacis, &c.	„
„	Vic' Norf' - -	Ric'o de Martham	Saisina de terra sua de Rollesby dimissa Warino de Rollesby, qui mortuus est.	„
„	Tho' de Sco' Waler'	Prisone - -	Deliberatio - - - -	xiiij. Oct.
	Tenentibus de honore comitatus Glouc'.	Ph'o de Langbergh et Will'o de Leic.	Custodia honoris Glouc', quia Comitissa Glouc' in fatu concessit.	Caversham. xv. Oct.

No. 6.—Specimen Calendar of the Patent Rolls, 1 Hen. III.—*continued.*

Memb.	Quibus Missæ.	Pro Quibus.	Summarium.	Apud.
1	Tenentibus de Bureford et Thornebir.	Ph'o de Langbergh et Will'o de Leic.	Custodia villæ de Bureford et manerii de Thornebir, quæ fuerunt Comitissæ Glouc', quæ in fata concessit.	Caversham. xv. Oct
„		Waltero de Glouc', mercatore de Cork.	Protectio - - - - -	xvij. Oct.
„	Tenentibus de manerio de Peteresfeld et Apeldereham.	Rad'o de Norwiz'.	Custodia maneriorum de Peteresfeld et Apeldercham.	xviij. Oct.
„	Priori de Norwico	Ysaac de Norwico	Quod chartæ et chyrographa sua ei deliberentur.	London. xxvj. Oct.
„	Rad'o Musard -	Will'o de Sancto Leodegario et Ric'o Bataill'.	Quod deliberentur per manucaptores -	„
„	Rob'to de Veteri Ponte.	Rob'to de Ros -	Quod deliberet filium suum per manucaptores.	„
„	Johanni de Manebrig.	Will'o Briwerr' -	Quod ei sit intendens de illis xl. solidis quos ipse reddere consuevit ad Scaccarium, et quos Rex Joh'es dedit dicto Will'o.	xxvij. Oct.
„	G. de Marisco, Justic' Hib'n'.	H. Dublin Archiepiscopo.	Exitus archiepiscopatus Armacensis et ecclesiarum cathedralium Armacensis provinciæ cum vacaverint.	xxviij. Oct.
„		Burgensibus de Dunwic'.	Protectio - - - - -	Westm. xxx. Oct.
„		Abbate de Fescamp.	„ - - - - -	„

Dorso.

15 d.	A. Vic. Thoarc', H. Com' March', R. Com' Augi, et aliis de Pictavia.	G. de Doc - -	Credentia - - - - -	Gloc. xxij. Dec.
„	Archiepiscopo Burdeg', Sen', Pict', et Wascon', &c.	„ - -	„ - - - - -	„
14 d.	Lodovico filio Regis Franciæ.	Rob'to de Dene et Gilberto Campion.	De imprisiis Regis nominandis, de interceptionibus infra treugas inter Regem et dictum Ludovicum captas emendandis.	xxviij. Dec.
13 d.	Omnibus - -	Rege - -	Charta Will'i de Ferrar', Comitis Dereb', de manerio de Meleburn habendo ad quartum decimum annum ætatis Regis.	—
„	„ - -	„ - -	Charta Hugonis Poinz de fidelitate sua Regi facienda.	—
„	„ - -	„ - -	Charta Nich'i Poinz de manucaptione sua pro fidelitate Hugonis filii sui.	—
„		Rege et Rad'o de Normanvill.	Conventio facta inter eos de Geroldo et Rad'o militibus filiis dicti Rad'i in servitio Regis tenendis.	—
„	Omnibus fidelibus de Rya.	Hominibus de Rya	Rex misit P. Wint' Ep'um, W. Com' Mar' et alios ad succursum eis faciendum.	Dorking. xxviij. Feb.
12 d.	W. Comiti Sarum et W. Mar', juniori.	W. Comite Sarum et W. Mar', juniore.	Littera W. Marescalli, Com' Pembr', et aliorum de conventione prolocuta inter Regem et W. Comitem Sarum et W. Mar' juniorem tenenda de revertendo ad fidem Regis.	—
„	Lodovico filio Regis Franciæ.	H. de Burgo, Justic' Angl', &c.	Littera W. Mar', Com' Pembrok, et consilii Regis de emendationibus faciendis de interceptionibus in treuga capta inter Regem et dictum Lodovicum.	—
„	Engeramo de Cusey, &c.	„ „ „	„ „ „ „	—
„	Regin' de Brausa -	Rege - -	Quod redeat ad fidem et servitium Regis. Et quod jura dicti Regin' ei restituentur.	Farnham. x. Mar.
10 d.	Omnibus - -	W. Comite Arundell.	Quod omnia quæ fuerint emendanda versus eum et imprisios suos apud Arundell emendentur.	Winton. vij. Apr.
„	W. Comiti Arundell, Petro filio Hereberti, Will'o de S. Joh'e, &c.	W. Comite Arundell, Petro filio Hereberti, et aliis.	De treugis eis concedendis - -	vlij. Apr.

No. 6.—Specimen Calendar of the Patent Rolls, 1 Hen. III.—*continued.*

Memb.	Quibus Missæ.	Pro Quibus.	Summarium.	Apud.
8 d.	W. Comiti Warenn'	W. Comite Warenn'	Ratificatio treugæ factæ inter Regem et concilium suum ex una parte et dictum Comitem ex altera.	Winton. xvj. Apr.
„	W. Com' Arundell, Petro filio Hereberti, et Will'o de S. Johanne.	Willielmo filio Johannis.	Rex habebit gratum quicquid dictus Will's fecerit, cum consilio Ep'i Cicestr', super interceptionibus factis infra treugam inter Regem et eos factam.	xxiij. Apr.
„	Papæ - -	Rege - -	Littera Regis de Canonicis Carleolensis ecclesiæ adhærentibus et faventibus Regi Scotiæ et inimicis Regis, &c.	xxvj. Apr.
„	Omnibus - -	Ph'o de Hadham -	Credentia de præstito usque ad summam decem marcarum.	xxvij. Apr.
„	Joh'i Constab'Cestr'	Joh'e Constabulario Cestriæ.	De conductu in veniendo ad loquendum cum Comite Pembroc' de pace sua.	Linc. xxiij. Maij.
„	Regin' de Braus' -	Regin' de Braus' -	„ „ „ „ „	„
6 d.	Universis - -	Regin' de Brewos -	Littera dicti Regin' de castro et civitate de Limeric receptis, usque ad quartum decimum annum ætatis Regis custodiendis.	—
„	„ - -	Regin de Braus' -	Littera dicti Regin' de terra et castris quæ fuerunt W. patris sui in Hibern' ei redditis.	—
5 d.	Comitibus et aliis Pictav'.	Regina matre Regis	Quod eam honorifice recipiant, et dote sua gaudere permittant.	Oxon. xxiiij. Jul.
„	Archiepiscopo Burdegal'.	„ „ „	„ „ „ „	—
„	Magnatibus de Rupell, et de Nivers, et de S. Johanne.	„ „ „	„ „ „ „	—
4 d.		W. de Ferrar' -	Matilda de Say attornat eum ad lucrandum, &c. de jure quod ipsa exigit versus Will'm de Mandevill in terris quæ fuerunt Comitis Will'i de Mandevill, in terris quæ fuerunt Will'i de Say patris ipsius Matildæ, et de terris quas ipsa adquisierit.	—
„	Universis - -	Florentino Divite et Will'o filio ejus de S. Audomar.	De vj. mil. marcis quas Rex eis debet eis solvendis.	Lamheye. xxj. Sept.
„	Omnibus - -	„ „ „	Conductus in ducendo mercandisas quas Rex eis vendidit.	xxij. Sept.
3 d.	Universis - -	„ „ „	Litteræ W. Mar', Comitis Pembr', de pecunia quam Rex eis debet, solvenda illi quem mittent.	—
„	Ph'o Regi Franc' -	„ „ „	De sex mil. marcis eis solvendis -	—
„	Omnibus - -	Thoma de Gasteny	Charta Th. de Arden de terra de Lyston, tenta de Enmigero de Bohun et data dicto Thomæ de Gasteny.	—
2 d.	„ - -	Rege - -	De inhibitione torneamenti apud Blyam.	Westm. iiij. Oct.

Prepared and examined by
(Signed) H. J. Sharpe.

No. 7.—Additions, in the Year 1864, to the Lists of Calendars, Indexes, &c., of Records in the Public Record Office, annexed to the Twenty-fourth and Twenty-fifth Reports of the Deputy Keeper of the Public Records.

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Chancery.

Page of Appendix to the Twenty-fourth Report.	Class to which the Calendars, &c., refer.	Title and Nature of Calendars, &c.	Period embraced, and whether complete or defective.	Whether in Manuscript or printed.	Remarks.
—	Plans annexed to Inclosure Awards.	Index	31 Geo. 2. to 7 Will. 4.	Printed in this Report, App. No. 1b.	With List, commencing with Queen's Bench.

Queen's Bench.

—	Plans annexed to Deeds and Inclosure Awards.	Index	Geo. 3. & 4.	Printed in this Report, App. No. 1a.	

Common Pleas.

26	Fines, Feet of	Index	16 Geo. 2. East. 1743 to 21 Geo. 2. Hil. 1747.	Manuscript	2 volumes.
—	Plans annexed to Deeds and Inclosure Awards.	Do.	Geo. 3. & 4.	Printed in this Report, App. No. 1a.	With List, commencing with Queen's Bench.

Exchequer: Plea, Crown, Equity, and Account Sides.

34	Commissions for taking Depositions. *Queen's Remembrancer.*	Depositions, Calendar and Index.	12 to 22 Jas. I. Complete.	Manuscript.	
37	Ministers' Accounts of Lands in the hands of the Crown under the Survey of the Court of General Surveyors. *Court of General Surveyors.*	Descriptive Catalogue.	1 to 24 Hen. 8.	Do.	10 volumes.

Exchequer of Receipt.

Page of Appendix to the Twenty-fourth Report.	Class to which the Calendars, &c., refer.	Title and Nature of Calendars, &c.	Period embraced, and whether complete or defective.	Whether in Manuscript or printed.	Remarks.
41	Records of the Exchequer of Receipt.	Inventories or Lists.	Complete -	Manuscript.	

Court of Admiralty.

—	Prize Causes subsequent to 1810, arising out of the War ended in 1814.	Index - -	1810, &c. -	Manuscript.	
—	Prize Causes, arising out of the War of 1815.	Do. - -	1815, &c. -	Do.	
—	Prize Appeal Causes in and subsequently to 1803, arising out of the Wars ended in 1815.	Do. - -	1803, &c. -	Do.	

Welsh Records.

58	Plea Rolls, Chester -	Calendar of Deeds, Inquisitions, and Writs of Dower.	Hen. 3. & Edw. 1.	Printed in this Report, App. No. 4.	
—	Warrants, Signed Bills, and Privy Seals (Chester and Flint).	Calendar -	Hen. 6. to Eliz. Defective.	Printed in this Report, App. No. 2.	
—	Writs of General Livery, Ouster-le-Main, &c. (Chester).	Do. -	Eliz. to Chas. 1. Defective.	Printed in this Report, App. No. 3.	

Audit Office.

The Documents are not open to the Public.

—	American Claims -	Catalogue -	1784 to 1789 -	Manuscript.	
—	Commissariat Service, Selections from the Mediterranean, Peninsula, and other Chests.	Do. -	End of last century and beginning of present century.	Do.	
—	Convicts, Shelton's Accounts touching the Transportation of.	Press List -	1789 to 1830 -	Do.	
—	Lisbon, Papers of Board of Claims at.	Catalogue -	1805? to 1833?	Do.	
—	Royal Military Canal Accounts.	Do. -	1805 to 1808 -	Do.	
—	Royal Warrants relating to Military, Naval, and Commissariat Services.	Do. -	1745 to 1837 -	Do.	
—	Slave Compensation Papers.	Do. -	1835 to 1846 -	Do.	
—	West India Commission Papers.	Do. -	1795 to 1825 -	Do.	

Home Office.

The Documents are open to the Public only to 1760.

Page of Appendix to the Twenty-fourth Report.	Class to which the Calendars, &c., refer.	Title and Nature of Calendars, &c.	Period embraced, and whether complete or defective.	Whether in Manuscript or printed.	Remarks.
72	Domestic Series -	Calendar -	1634 to 1635 -	Printed -	The remainder of the reign in progress.
„	Do. - -	Do. -	1665 to 1666 -	Do. - -	Do.

Foreign Office.

The Documents are open to the Public only to 1688.

—	Royal Letters - -	Calendar -	Hen. 8. to Geo. 3.	Manuscript -	5 volumes.

Treasury.

The Documents are open to the Public only to 1820.

—	Colonial Audit Office	Catalogue -	1797 to 1855 -	Manuscript.	
—	Commissariat Service-in-chief; Alphabetical Registers of Letters, &c., received.	Press List -	1810 to 1848 - Complete.	Do.	
—	Commissariat, Books relating to the Crimean War.	Do. -	1854 to 1859 - Complete.	Do.	
—	Commissariat, Letter Books.	Do. -	1793 to 1849 - Complete.	Do.	
—	Commissariat, Miscellaneous Books.	Do. -	1798 to 1856 - Complete.	Do.	
80	Treasury Board Papers.	Do. -	1700 to 1770; 1786 to 1796— Incomplete.	Do.	

War Office.

The Documents are open to the Public only to 1820.

—	Regimental Pay Lists	Catalogue -	1855 to 1858 -	Manuscript.	

REFORM CLUB
PALL MALL

LONDON:
Printed by GEORGE E. EYRE and WILLIAM SPOTTISWOODE,
Printers to the Queen's most Excellent Majesty.
For Her Majesty's Stationery Office.

SEWAGE OF TOWNS.

THIRD REPORT

AND APPENDICES

OF

THE COMMISSION

APPOINTED

TO INQUIRE INTO THE BEST MODE

OF

DISTRIBUTING THE SEWAGE OF TOWNS,

AND

APPLYING IT TO BENEFICIAL AND PROFITABLE USES.

Presented to both Houses of Parliament by Command of Her Majesty.

LONDON:
PRINTED BY GEORGE E. EYRE AND WILLIAM SPOTTISWOODE,
PRINTERS TO THE QUEEN'S MOST EXCELLENT MAJESTY.
FOR HER MAJESTY'S STATIONERY OFFICE.

10746. 1865.

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REFORM CLUB

THIRD REPORT OF THE COMMISSION.

To the Lords Commissioners of Her Majesty's Treasury.

May it please your Lordships,

We, the undersigned, whom Her Majesty's Commission, bearing date 5th January 1857, appointed to "inquire into the "best mode of distributing the Sewage of Towns, and applying "it to beneficial and profitable uses," have now again, according to our instructions, the honour of reporting to your Lordships our further progress in the matter committed to us for inquiry.

Since the date of our last Report (August 1861) we have, through a committee of our number, consisting of Mr. Lawes and Professor Way, continued at Rugby the experiments which were undertaken in 1861 on the application of sewage to land. The report of that committee, which we append, contains the results for the three years 1862–4.

Your Lordships will observe that these experiments have not been confined to the application of sewage in different quantities to land, but have extended to the consumption, by cattle, of the produce so obtained, and to the production of meat and milk, and have been accompanied by a careful record of the quantities and market-value of the products, and by numerous analyses of the sewage before and after irrigation, as also of the grass and of the milk.

It appears to us that these experiments have solved many of the difficulties which have hitherto attached to the question of the agricultural application of sewage, and that they leave no reasonable doubt of the practicability and advantage of so employing the sewage of towns.

We have also continued to give our best attention to all kindred experiments and inquiries which have been going on elsewhere.

As the results of our labours, extending over eight years, we have confidence in submitting to your Lordships the following conclusions:—

1. The right way to dispose of town sewage is to apply it continuously to land, and it is only by such application that the pollution of rivers can be avoided.
2. The financial results of a continuous application of sewage to land differ under different local circumstances; first, because in some places irrigation can be effected by gravity, while in other places more or less pumping must be employed; secondly, because heavy soils (which in

given localities may alone be available for the purpose) are less fit than light soils for continuous irrigation by sewage.

3. Where local circumstances are favourable, and undue expenditure is avoided, towns may derive profit, more or less considerable, from applying their sewage in agriculture. Under opposite circumstances, there may not be a balance of profit; but even in such cases a rate in aid, required to cover any loss, needs not be of large amount.

Finally, on the basis of the above conclusions, we further beg leave to express to your Lordships that, in our judgment, the following two principles are established for legislative application:—

First, that, wherever rivers are polluted by a discharge of town sewage into them, the towns may reasonably be required to desist from causing that public nuisance:

Second, that where town-populations are injured or endangered in health by a retention of cesspool-matter among them, the towns may reasonably be required to provide a system of sewers for its removal.

And should the law, as it stands, be found insufficient to enable towns to take land for sewage-application, it would, in our opinion, be expedient that the legislature should give them powers for that purpose.

(Signed) Essex.
Robert Rawlinson.
J. Thomas Way.
J. B. Lawes.
John Simon.

8, Richmond Terrace, Whitehall.
March 1865.

Second Report of Experiments on the Application of Town Sewage to Grass Land, conducted at Rugby, by Order of the Royal Sewage Commission.

Seasons 1861, 1862, and 1863.

In the Second Report of the Commission, presented to both Houses of Parliament in 1862, an account was given of the results obtained in the First Season (1861) of Experiments on the application of town sewage to grass land, which were undertaken by order of the Royal Sewage Commission, and conducted in the neighbourhood of Rugby, where, arrangements being made for the distribution of the sewage of the town over a considerable area of adjacent land, the conditions were considered well adapted for the purposes of the inquiry.

As stated in the preliminary Report above referred to, the Commission, guided by the information acquired in the course of their investigation of the then existing experience on the subject, which had led them to visit almost every locality where town sewage was applied in any way to the purposes of agriculture, had come to the conclusion that to obtain the largest amount and value of produce at the least proportionate cost for distribution, dilute town sewage should be applied to the growth of succulent crops, and that it was best adapted for grass. It was decided, therefore, to confine attention, at any rate in the first instance, to grass alone.

In arranging the experiments, it was considered that the object was to provide such information as might be taken as the basis of arrangements for the application of the sewage of towns, in the manner the most advantageous to both urban and rural interests.

To this end it was sought to determine:—

1. The amount and the composition of the produce, in relation—
   to the amount of water supplied to the land by irrigation,
   to the amount of manurial constituents so applied, and to
   the amount of population contributing the manurial constituents to the water.
2. The most profitable method of utilising the produce; that is, whether it should be used in the green state or as hay; whether for the production of milk or of meat; and whether it should be consumed alone or in conjunction with other food.

In the experiments of the first year, three portions of land, of about five acres each, were operated upon, and each of these was divided into four plots, to be treated, respectively, as follows:

Plot 1. To be unsewaged.

Plot 2. To be irrigated with sewage at the rate of 3,000 tons per acre per annum.

Plot 3. To be sewaged at the rate of 6,000 tons per acre per annum.

Plot 4. To be sewaged at the rate of 9,000 tons per acre per annum.

The produce of one such set of four plots was to be given, in the green state, to fattening oxen; that of the second (also in the green state) to milking cows; and that of the third was to be made into hay.

As explained in the former Report, owing to deficient supply, but little sewage was applied to the portion of land devoted to the production of hay; and, since the first season, the five acres in question have each year been sublet.

The results obtained in the first year's experiments on the other portions of land were given in detail in the previous Report; but it was admitted that the experience of one year only could be taken as little more than initiative on many points; it being obviously essential to determine the effects of the continued application, and the influence of seasons of different characters, before safe deductions could be drawn in regard to some of the most important economical questions at issue.

The results of two more seasons (1862 and 1863) are now at command; and it is proposed to call attention chiefly to the difference of result obtained in the different seasons, and to the average result over the three seasons, making but few comments on those of each separate season. The full details will, however, be given for reference, in the tabular form, in Appendix, No. I., p. 81, et seq.

In addition to the experiments above referred to, which are a continuation of those already reported, by the kindness of Mr. Campbell some results obtained on the application of sewage to Italian rye-grass and to oats are also given.

For the convenience of reference and comparison, the numerical results will, as far as possible, be arranged in the same form, and the subject considered in the same order, as in the former Report.

I. *Quantities of Sewage applied, and of Green Produce obtained.*

In the first season (1861) the application of sewage did not commence until March in the one field, and April in the other; but, as it was considered that any scheme for the general application of town sewage to agricultural purposes must of necessity be based on the fact of a daily supply the year round, which

must be dealt with in winter when of comparatively little value as well as in summer when of more, the amounts of 3,000, 6,000, and 9,000 tons, respectively, were, in the second and third seasons, distributed over the entire year, and the quantities supplied from November 1st of one year to October 31st of the next were taken as those to which the increase of crop was due.

The detailed records relating to the application of the sewage are given for reference in Tables I. and II. pp. 81–89. Appendix, No. 1. Of these, Table I., which now follows, is a convenient summary.

TABLE I.—Quantities of Sewage applied per Acre, on each Plot, in each Month, in each of the Three Seasons.

—	Sewage per Acre.					
	Five-acre Field.			Ten-acre Field (half).		
	Plot 2.	Plot 3.	Plot 4.	Plot 2.	Plot 3.	Plot 4.
1st Season, 1861; March—October, inclusive.						
	Tons.	*Tons.*	*Tons.*	*Tons.*	*Tons.*	*Tons.*
March	632·1	1015·1	1444·2	..	..	..
April	279·9	666·4	1177·0	563·0	1145·9	1376·9
May	75·8	96·5	97·7	18·3	64·1	118·3
June	78·8	223·3	577·2	..	..	392·3
July	531·7	430·2	654·1	512·0	392·2	905·7
August	130·6	580·2	787·3	225·9	316·3	595·1
September	143·1	703·3	614·7	34·0	517·7	381·8
October	201·7	678·2	800·7	34·0	367·7	455·8
Totals	2073·7	4423·2	6152·9	1387·2	2803·9	4226·4
Rate per annum	3110·4	6634·8	9229·1	2378·1	4806·7	7245·5
2d Season, 1862; November 1861—October 1862, inclusive.						
November 1861	313·1	499·8	745·0	116·3	341·5	451·4
December „	126·6	429·8	527·6	71·5	143·5	277·3
January 1862	323·0	457·6	583·3	77·4	159·2	235·7
February „	169·2	575·0	751·6	227·5	187·2	330·1
March „	235·4	455·8	478·2	109·9	374·0	524·7
April „	211·8	503·0	720·1	508·5	903·5	876·3
May „	281·8	581·4	763·0	289·6	425·1	1201·5
June „	77·1	164·7	292·7	173·0	327·0	410·6
July „	580·1	840·4	1323·7	595·5	1255·9	2017·0
August „	309·1	476·9	1442·0	397·5	1000·8	1385·6
September „	79·4	623·6	628·6	177·6	396·3	776·9
October „	285·2	386·5	730·9	255·2	485·5	517·3
Totals	2991·8	5094·5	8986·7	2999·5	5999·5	9004·3

TABLE I.—*continued.*

Quantities of Sewage applied per Acre, on each Plot, in each Month, in each of the Three Seasons.

	SEWAGE PER ACRE.					
	FIVE-ACRE FIELD.			TEN-ACRE FIELD (half).		
	Plot 2.	Plot 3.	Plot 4.	Plot 2.	Plot 3.	Plot 4.
3d SEASON, 1863; November 1862—October 1863, inclusive.						
November 1862	201·9	513·0	806·8	288·2	597·6	771·3
December „	114·2	315·2	500·1	151·6	625·5	894·6
January 1863	351·2	429·3	580·2	493·6	436·0	849·3
February „	194·6	550·6	655·4	200·9	550·9	1013·6
March „	482·7	774·4	1375·8	203·9	390·8	397·0
April „	234·2	550·9	640·5	203·9	395·8	592·5
May „	90·4	579·3	555·3	39·8	582·9	742·3
June „	896·6	540·9	462·5	385·4	974·8	949·1
July „	100·9	426·4	980·6	492·4	344·8	779·6
August „	..	409·5	964·2	150·0	..	717·0
September „	275·1	617·3	660·3	..	640·9	495·1
October „	57·1	232·8	819·0	391·3	459·8	797·1
Totals	2998·9	5999·6	9000·7	3001·0	5999·8	8998·5
SUMMARY. 1861, 1862, and 1863.						
1st Season; to Oct. 31, 1861	2073·7	4423·2	6152·9	1387·2	2803·9	4226·4
2d Season; to Oct. 31, 1862	2991·8	5994·5	8986·7	2999·5	5999·5	9004·3
3d Season; to Oct. 31, 1863	2998·9	5999·6	9000·7	3001·0	5999·8	8998·5
Totals	8064·4	16417·3	24140·3	7387·7	14803·2	22229·2

It is seen that when calculated over the entire season the supply of sewage was in each case very nearly at the rate intended, but that it varied considerably from month to month. Regularity in this respect was, indeed, sought to be attained within certain limits, but it was necessarily subject to various controlling circumstances. Thus, the sewage was, as a rule, applied on the same plot for an entire day at a time, in order the better to secure its even distribution over the whole, and the rate of flow, and consequently the day's supply, varied considerably. Then, again, throughout the summer months the stage of growth of the crop much influenced the time of application, which was regulated so as to ensure, as far as possible, the beneficial action of the total quantity applied in each case. Occasionally, too, the supply was entirely stopped, owing to derangements in the machinery, a matter over which there was unfortunately no control.

The amounts of green grass obtained from the respective plots, in each of the three seasons, are shown in Tables II. and III. (pp. 9 and 10); Table II. giving the amounts obtained in each separate month, and Table III. those in each successive crop. For further details, *see* Appendix Tables, III. and IV., pp. 90–96.

TABLE II.—Amount of Green Grass obtained during each separate Month.

	GREEN GRASS PER ACRE.																							
	FIVE-ACRE FIELD.												TEN-ACRE FIELD (half).											
	Without Sewage.				With Sewage.								Without Sewage.				With Sewage.							
	Plot 1.				Plot 2.				Plot 3.				Plot 4.				Plot 1.				Plot 2.			
	tons.	cwts.	qrs.	lbs.	tons.	cwts.	qrs.	lbs.	tons.	cwts.	qrs.	lbs.	tons.	cwts.	qrs.	lbs.	tons.	cwts.	qrs.	lbs.	tons.	cwts.	qrs.	lbs.
FIRST SEASON, 1861.																								
May	–	–	–	–	–	–	–	–	–	–	–	–	1	9	3	14	–	–	–	–	0	14	0	20
June	3	2	3	27	4	17	0	14	7	19	1	23	8	14	3	8	4	10	1	1	4	11	2	8
July	3	1	0	8	2	8	0	15	4	6	0	26	6	14	0	13	0	8	1	18	5	5	1	2
Aug.	–	–	–	–	3	16	2	23	4	12	2	8	5	19	2	24	1	6	3	9	0	10	2	26
Sept.	2	2	2	8	1	3	0	12	6	5	1	7	5	0	0	5	2	3	2	7	0	11	0	13
Oct.	0	19	0	18	2	11	3	0	0	8	0	24	0	16	0	23	0	9	0	8	3	19	1	15
Nov.	–	–	–	–	–	–	–	–	3	9	1	6	4	2	0	5	–	–	–	–	–	–	–	–
Dec.	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	0	4	0	2
Totals	9	5	3	5	14	16	3	8	27	1	0	10	32	16	3	8	8	18	0	15	15	16	3	2
SECOND SEASON, 1862.																								
May	–	–	–	–	0	19	1	19	9	15	3	9	8	7	3	6	0	17	1	16	1	14	0	5
June	0	8	1	26	5	10	0	10	5	16	0	26	5	15	1	15	7	10	2	11	15	0	0	3
July	3	16	0	23	8	2	3	3	–	–	–	–	4	19	1	19	2	11	2	0	0	8	2	24
Aug.	2	8	2	10	4	16	2	16	9	12	0	25	2	0	2	24	0	11	3	0	6	12	1	3
Sept.	–	–	–	–	4	0	1	10	6	12	2	10	9	15	0	0	3	8	0	17	0	16	0	8
Oct.	1	10	0	7	4	8	3	16	2	13	1	5	1	11	1	14	–	–	–	–	3	0	0	5
Nov.	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	10	3	9	–	–	–	–
Totals	8	3	1	10	27	18	0	18	34	10	0	19	32	9	2	22	16	10	0	25	27	11	0	20
THIRD SEASON, 1863.																								
April	–	–	–	–	–	–	–	–	–	–	–	–	3	16	3	12	–	–	–	–	–	–	–	–
May	–	–	–	–	4	9	1	25	12	4	3	18	6	0	0	15	–	–	–	–	–	–	–	–
June	–	–	–	–	6	4	3	5	3	9	2	20	10	13	2	0	3	7	3	25	13	1	3	22
July	3	18	3	14	6	7	3	9	5	17	2	2	–	–	–	–	2	19	3	27	5	13	0	6
Aug.	–	–	–	–	–	–	–	–	4	2	3	5	7	15	3	16	–	–	–	–	–	–	–	–
Sept.	0	19	3	27	2	7	1	27	6	12	0	23	7	14	0	2	1	12	3	23	6	1	0	2
Oct.	–	–	–	–	2	12	1	15	2	5	3	5	0	14	1	20	–	–	–	–	–	–	–	–
Nov.	–	–	–	–	0	3	0	16	0	5	2	10	0	5	2	24	–	–	–	–	0	9	1	6
Totals	4	18	3	13	22	5	0	11	34	18	1	27	37	0	2	5	8	0	3	19	25	5	1	8

	GREEN GRASS PER ACRE.											
	TEN-ACRE FIELD (half).											
	With Sewage.											
	Plot 3.				Plot 4.							
	tons.	cwts.	qrs.	lbs.	tons.	cwts.	qrs.	lbs.				
FIRST SEASON, 1861.												
May	1	4	0	10	2	5	0	0				
June	5	4	1	7	8	16	1	7				
July	5	8	0	19	1	16	3	24				
Aug.	4	12	1	1	5	4	2	7				
Sept.	1	15	0	3	4	16	2	0				
Oct.	4	0	3	7	3	6	0	2				
Nov.	–	–	–	–	–	–	–	–				
Dec.	0	7	3	21	0	8	2	0				
Totals	22	15	2	12	26	13	3	12				
SECOND SEASON, 1862.												
May	11	13	2	7	8	14	0	21				
June	2	7	2	20	1	15	1	7				
July	6	9	3	6	8	16	1	2				
Aug.	–	–	–	–	2	15	3	8				
Sept.	9	16	1	22	6	2	2	12				
Oct.	1	14	3	15	3	8	0	26				
Nov.	–	–	–	–	–	–	–	–				
Totals	32	2	1	14	31	12	1	20				
THIRD SEASON, 1863.												
April	–	–	–	–	3	14	3	0				
May	9	0	0	24	4	7	2	27				
June	5	16	0	22	11	13	2	21				
July	4	15	0	13	0	9	3	12				
Aug.	5	14	3	0	7	16	2	14				
Sept.	2	1	5	1	12	0	12	3	0			
Oct.	–	3	9	3	20	5	12	2	3			
Nov.	0	10	0	5	0	11	2	0				
Totals	30	11	2	12	34	19	1	21				

TABLE III.—Amounts of Green Grass obtained in each successive Crop.

	Green Grass per Acre.																							
	Five-acre Field.												Ten-acre Field (half).											
	Without Sewage.	With Sewage.											Without Sewage.	With Sewage.										
	Plot 1.	Plot 2.			Plot 3.			Plot 4.			Plot 1.			Plot 2.			Plot 3.			Plot 4.				
	tons.	cwts.	qrs.	lbs.	tons.	cwts.	qrs.	lbs.	tons.	cwts.	qrs.	lbs.	tons.	cwts.	qrs.	lbs.	tons.	cwts.	qrs.	lbs.	tons.	cwts.	qrs.	lbs.
First Season, 1861.																								
1st Crop	6	4	0	7	7	5	1	1	10	7	0	21	13	5	1	22	4	18	2	19	9	13	3	12	11	5	3	2	11	1	1	4
2d Crop	3	1	2	26	4	3	1	25	7	8	1	0	9	15	0	11	3	19	1	24	2	11	0	0	5	18	2	17	7	1	2	6
3d Crop	–	–	–	–	3	4	0	11	5	16	1	8	5	14	0	26	–	–	–	–	3	2	3	16	5	3	1	0	8	2	2	2
4th Crop	–	–	–	–	0	3	3	27	3	9	1	6	4	2	0	5	–	–	–	–	0	4	0	2	0	7	3	21	0	8	2	0
Totals	9	5	3	5	14	16	3	8	27	1	0	10	32	16	3	8	8	18	0	15	15	16	3	2	22	15	2	12	26	13	3	12
Second Season, 1862.																								
1st Crop	6	13	1	3	14	12	1	4	15	12	0	7	14	3	0	21	10	19	1	27	16	14	0	8	14	1	0	27	8	14	0	21
2d Crop	1	10	0	7	8	16	3	26	9	12	0	25	7	0	0	15	3	19	3	17	7	0	3	27	6	9	3	6	10	11	2	9
3d Crop	–	–	–	–	3	18	1	9	8	1	0	5	9	15	0	0	1	10	3	9	3	7	3	2	9	16	1	22	8	18	1	20
4th Crop	–	–	–	–	0	10	2	7	1	4	3	10	1	11	1	14	–	–	–	–	0	8	1	11	1	14	3	15	3	2	0	5
5th Crop	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	0	6	0	21
Totals	8	3	1	10	27	18	0	18	34	10	0	19	32	9	2	22	16	10	0	25	27	11	0	20	32	2	1	14	31	12	1	29
Third Season, 1863.																								
1st Crop	3	18	3	14	10	14	1	0	12	4	3	18	9	16	3	27	6	7	3	24	13	1	3	22	12	9	0	7	8	2	1	27
2d Crop	0	19	3	27	6	7	3	9	9	7	0	22	10	13	2	0	1	12	3	23	5	13	0	6	7	2	1	24	11	13	2	21
3d Crop	–	–	–	–	4	2	3	24	7	2	3	1	6	18	2	5	–	–	–	–	6	1	0	2	7	0	0	12	8	6	1	26
4th Crop	–	–	–	–	0	16	3	18	5	18	0	4	8	11	1	13	–	–	–	–	0	9	1	6	3	9	3	20	6	5	1	3
5th Crop	–	–	–	–	0	3	0	16	0	5	2	10	0	14	1	20	–	–	–	–	–	–	–	–	0	10	0	5	0	11	2	0
6th Crop	–	–	–	–	–	–	–	–	–	–	–	–	0	5	2	24	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Totals	4	18	3	13	22	5	0	11	34	18	1	27	37	0	2	5	8	0	3	19	25	5	1	8	30	11	2	12	34	19	1	21
Summary—1861, 1862, and 1863.																								
1861	9	5	3	5	14	16	3	8	27	1	0	10	32	16	3	8	8	18	0	15	15	16	3	2	22	15	2	12	26	13	3	12
1862	8	3	1	10	27	18	0	18	34	10	0	19	32	9	2	22	16	10	0	25	27	11	0	20	32	2	1	14	31	12	1	20
1863	4	18	3	13	22	5	0	11	34	18	1	27	37	0	2	5	8	0	3	19	25	5	1	8	30	11	2	12	34	19	1	21
Average	7	9	1	9	21	13	1	12	32	3	1	0	34	2	1	12	11	5	0	10	22	17	3	1	28	9	3	13	31	1	3	18

Table II. shows that the crops obtained before the end of May were very much larger in the second and third seasons than in the first season, in which case no sewage had been applied during the winter months. The much greater luxuriance of growth in the early season was, indeed, remarkable after the winter applications; and the crops were invariably in the most forward condition where the largest quantities of sewage had been applied. There is, of course, a great advantage in getting an early cut of green food, and a given weight will be worth more quite early in the season than some weeks later. Still, it is not to be supposed that the same amount of increase of produce will be obtained for a given amount of sewage applied during winter, as during the periods of active growth.

It is also to be observed that the crops obtained late in the season, in September and afterwards for example, were always considerably heavier with sewage than without it, heavier with 6,000 tons than with 3,000, and generally heavier with 9,000 than with 6,000.

Thus, not only was the total amount of produce obtainable per acre very much increased by the application of sewage, but the period during which an abundance of green food was available was extended considerably, both at the beginning and the end of the season, and it was the more so the larger the quantity of sewage applied, almost up to the highest amount adopted in the experiments, namely, 9,000 tons per acre.

Table III. shows that in only one instance, that of the 10-acre field in the wet and cold season of 1862, was there any third cut at all without sewage, whilst, with sewage, four or more cuttings were always obtained, and the later crops were pretty uniformly the larger the larger the quantity of sewage applied.

Leaving the question of the amounts of produce obtained during each separate month, or at each successive cutting, Table IV. shows the total amount of produce on each plot, in each of the three seasons, and also the amount of increase for every 1,000 tons of sewage applied; and produce and increase are each recorded both as green grass, and calculated as hay. The means of the results obtained in the two fields are also given.

TABLE IV.—Total Amounts of Produce, and the Increase for 1,000 Tons of Sewage applied, both reckoned as Green Grass, and calculated as Hay.

SEASONS 1861, 1862, and 1863.

	Five-acre Field.				Ten-acre Field (half).				Mean of the two Fields.			
	Without Sewage.	With Sewage.			Without Sewage.	With Sewage.			Without Sewage.	With Sewage.		
	Plot 1.	Plot 2.	Plot 3.	Plot 4.	Plot 1.	Plot 2.	Plot 3.	Plot 4.	Plot 1.	Plot 2.	Plot 3.	Plot 4.
Produce per Acre, per Annum, as Green Grass.												
	tons. cwts. qrs. lbs.	*tons. cwts. qrs. lbs.*	*tons. cwts. qrs. lbs.*	*tons. cwts. qrs. lbs.*	*tons. cwts. qrs. lbs.*	*tons. cwts. qrs. lbs.*	*tons. cwts. qrs. lbs.*	*tons. cwts. qrs. lbs.*	*tons. cwts. qrs. lbs.*	*tons. cwts. qrs. lbs.*	*tons. cwts. qrs. lbs.*	*tons. cwts. qrs. lbs.*
1861	9 5 3 5	14 16 3 8	27 1 0 10	32 16 3 8	8 18 0 15	15 16 3 2	22 15 2 12	26 13 3 12	9 1 3 24	15 6 3 5	24 18 1 11	29 15 1 10
1862	8 3 1 10	27 18 0 18	34 10 0 19	32 9 2 22	16 10 0 25	27 11 0 20	32 2 1 14	31 12 1 20	12 6 3 1	27 14 2 19	33 6 1 3	32 1 0 7
1863	4 18 3 13	22 5 0 11	34 18 1 27	37 0 2 5	8 0 3 19	25 5 1 8	30 11 2 12	34 19 1 21	6 9 3 16	23 15 0 24	32 15 0 6	35 19 3 27
Average	7 9 1 9	21 13 1 12	32 3 1 0	34 2 1 12	11 3 0 10	22 17 3 1	28 9 3 13	31 1 3 18	9 6 0 24	22 5 2 7	30 6 2 6	32 12 0 15
Produce per Acre, per Annum, calculated as Hay.*												
1861	2 19 0 17	4 3 1 24	6 3 0 0	7 5 0 27	2 11 1 24	3 15 2 20	4 9 1 6	5 5 1 4	2 15 1 7	3 19 2 8	5 6 0 17	6 5 1 2
1862	2 10 1 23	6 8 2 13	5 19 2 15	6 2 0 11	4 13 3 4	5 17 3 16	5 14 1 5	6 10 1 15	3 12 0 14	6 3 1 1	5 16 3 24	6 6 0 27
1863	2 2 0 10	5 4 0 22	6 2 1 1	7 1 0 13	3 7 2 27	5 0 3 18	6 4 1 25	6 12 3 2	2 14 3 19	5 2 2 6	6 3 1 13	6 16 3 22
Average	2 10 2 7	5 5 1 20	6 1 2 15	6 16 0 17	3 11 0 0	4 18 0 18	5 9 1 3	6 2 3 7	3 0 3 4	5 1 3 5	5 15 1 23	6 9 1 26
Increase, reckoned as Green Grass, for each 1,000 Tons of Sewage applied.												
1861	..	2 19 1 7	4 0 1 9	3 16 2 6	..	4 19 3 23	4 18 3 23	4 4 0 20	..	3 19 2 15	4 9 2 16	4 0 1 13
1862	..	6 11 3 23	4 7 3 16	2 14 0 13	..	3 13 2 20	2 12 0 4	1 13 2 7	..	5 2 3 8	3 9 3 24	2 3 3 10
1863	..	5 15 1 22	4 19 3 21	3 11 1 4	..	5 14 3 1	3 15 0 13	2 19 3 10	..	5 15 0 12	4 7 2 3	3 5 2 7
Average	..	5 2 0 27	4 9 1 15	3 7 1 8	..	4 16 0 15	3 15 1 13	2 19 0 22	..	4 19 0 21	4 2 1 14	3 3 1 1
Increase, calculated as Hay, for each 1,000 Tons of Sewage applied.*												
1861	..	0 12 3 20	0 14 1 21	0 13 3 27	..	0 17 2 8	0 13 2 6	0 12 3 3	..	0 15 1 0	0 14 0 0	0 13 1 15
1862	..	1 6 0 14	0 11 2 5	0 7 3 25	..	0 8 0 4	0 3 1 19	0 4 0 7	..	0 17 0 9	0 7 1 26	0 6 0 2
1863	..	1 0 2 23	0 13 1 13	0 11 0 0	..	0 11 0 6	0 9 1 23	0 7 0 25	..	0 15 3 15	0 11 1 18	0 9 0 13
Average	..	0 19 3 19	0 13 0 13	0 10 3 27	..	0 12 0 25	0 8 3 7	0 8 0 2	..	0 16 0 8	0 10 3 24	0 9 2 1

* The amount of hay to which the grass is supposed to be equivalent, is calculated by raising the amount of the experimentally determined perfectly dry or solid substance in the grass, in the proportion of from 84 to 100, on the assumption that the hay would contain 84 per cent. of dry substance and 16 per cent. moisture.

In the first and third years (1861 and 1863) there was, in both fields, more produce, whether reckoned as green grass or as hay, with each increased amount of sewage applied. In the wet and cold season of 1862, however, although there was considerably more green produce per acre from 6,000 tons of sewage than from 3,000, yet, owing to its more succulent condition, the amounts with the larger quantities of sewage represented even a few cwts. less of hay. On the other hand, with 9,000 tons of sewage, the produce of green grass was, in this wet season, in both fields, less than with 6,000 tons, but calculated as hay it was slightly more. In no case, however, is the increase with the larger amounts of sewage in proportion to the increased application. This point is well illustrated in the two lower sections of Table IV., which give, not the produce per acre, but the increase for each 1,000 tons of sewage applied, reckoned respectively as green grass and as hay.

It is obvious that the proportion of the produce to be reckoned as increase due to the sewage applied must depend very much on the yield of the unmanured land with which the produce of the sewaged land is to be compared. It is necessary, therefore, to bear in mind the quality and condition of the land upon which the experiments were made, when estimating and judging of the amounts of increase yielded for a given amount of sewage applied. Both fields were fattening pastures. It may safely be concluded, therefore, that their natural or unmanured produce would be higher than that of the average of such land as would be likely to be devoted to the growth of grass by means of sewage on the large scale. On the other hand, there is no reason to suppose that under the influence of a liberal supply of sewage, the produce would be in a corresponding degree higher on land of high natural yield than on land which, from its suitable physical qualities, might, with sewage, yield heavy crops, but without it, very light and poor ones. Then, again, a large proportion of the grasses of a good fattening pasture will yield less produce under the influence of sewage than others associated with them, and it is not until the application has been continued for some years that the more freely growing grasses become so far dominant as to secure the maximum result for a given amount of sewage that soil and season will admit of. For these reasons it seems probable that the amounts of *increase* obtained for a given amount of sewage, applied in these experiments, are more likely to be below than above those which may be anticipated on the continued application of sewage, over large areas of land, selected, prepared, and properly seeded for the purpose.

As between the two fields, it should be stated that, to the five-acre field no sewage had been applied during the season preceding the commencement of the experiments; one crop of hay had been taken from it, and it had afterwards been eaten down by sheep. To the ten-acre field, however, sewage had been applied in indefinite quantity for nearly 12 months; two crops of hay had been taken from the land in the previous year, and it had been kept very closely grazed down by stock, almost up to the time of

commencing the experiment. Thus, though the land of this field was undoubtedly of higher natural quality, and was probably also in a higher condition, so far as the influence of recent manuring was concerned, yet, owing to its herbage being so much more closely grazed down, it was in that respect in a less favourable condition for the first year's crop, and accordingly, in the first season, gave, without sewage, less produce than the other, though in succeeding seasons it gave much more. Indeed, whilst in the five-acre field the produce without sewage diminished from year to year, being even less in the second year than in the first, notwithstanding the much larger amount of rain, it was in the ten-acre field so very much larger in the second year than in the first, and so very much larger in both the second and third years in that field than in the other, that it was thought, until full inquiry had been made, that there must be some error either in the measurement of the land or in the records. None was, however, found; and the difference in the character and composition of the two soils, which subsequent examination showed, satisfactorily accounted for the great difference in their natural yield. For further information on this point see p. 63.

These few remarks on the character and condition of the land in the two fields will serve as some explanation of the proportionally much greater difference in the amounts of increase over the natural produce from a given amount of sewage, than in the amounts of total produce per acre, where the same amounts of sewage are applied in the different fields, or in different seasons. A few comments only need be made on the results themselves as recorded in the Table.

In the first season the sewage was not applied experimentally until March in the five-acre, and April in the ten-acre field, and hence the amounts of increase of produce yielded had to be reckoned as due to comparatively small quantities of sewage applied. Taking the average result of the two fields, the increase obtained for 1,000 tons of sewage applied, when reckoned as green grass, was rather more when the two larger than when the smallest quantity of sewage was applied per acre, but reckoned at one uniform condition of dryness as hay, it was slightly less with each increased amount of sewage applied.

In the wet and cold season of 1862, which was, of course, favourable for the unsewaged land, and by comparison the less appropriate the greater quantity of sewage applied, the amount of increase for 1,000 tons of sewage, whether reckoned as green grass or as hay, diminished considerably with each increase of sewage applied per acre. And notwithstanding the amounts of total produce per acre with equal quantities of sewage were not very different in the two fields, the amounts reckoned as increase for 1,000 tons of sewage applied were very much less in the ten-acre than in the five-acre field, owing to the much larger produce without sewage in the former.

In 1863 again, though a much warmer and more genial season for the action of sewage, there was still, though in a much less

degree than in 1862, a diminishing proportion of increase for 1,000 tons of sewage, the larger the quantity applied per acre. There was also, owing chiefly to the much larger produce without sewage, much less to be reckoned as increase for each 1,000 tons of sewage applied in the ten-acre than in the five-acre field.

It is worthy of remark, that although the produce per acre without sewage is so much the greater in the ten-acre field than in the other, it is with equal, but especially with the larger amounts of sewage, pretty uniformly the greater in the five-acre field. This result was doubtless partly due to its being better fitted, from its porosity, for sewage irrigation, but partly also to the fact, that whilst it was comparatively flat, allowing the sewage to pass over it more slowly and so to be better absorbed, the ten-acre field was in high ridges, and steeply inclined, rendering it difficult to prevent the water running over it too quickly. This point will be illustrated further on by reference to the comparative composition of the drainage water from the two fields.

Taking the average results of the three years, and the two fields, we have, with sewage applied at the rate of 3,000 tons per acre per annum a produce per acre of a little over $22\frac{1}{4}$ tons of green grass, equal rather more than 5 tons of hay; with 6,000 tons of sewage rather more than $30\frac{1}{4}$ tons of green grass, equal rather more than $5\frac{3}{4}$ tons of hay; and with 9,000 tons of sewage rather more than $32\frac{1}{2}$ tons of green grass, equal about $6\frac{1}{2}$ tons of hay.

The largest quantities of produce reached were those obtained with the largest quantities of sewage (9,000 tons per acre per annum), and in the third year of the experiments, amounting in the five-acre field to 37 tons of green grass, equal rather more than 7 tons of hay, and in the ten-acre field to nearly 35 tons of green grass, equal nearly 6 tons 13 cwts. of hay.

The average increase of green grass over the natural produce for 1,000 tons of sewage applied was, with 3,000 tons of sewage per acre nearly 5 tons, with 6,000 tons of sewage rather more than 4 tons, and with 9,000 tons not quite $3\frac{1}{4}$ tons. Reckoned as hay, the average increase for 1,000 tons of sewage was, with 3,000 tons of sewage per acre 16 cwts., with 6,000 tons nearly 11 cwts., and with 9,000 tons $9\frac{1}{2}$ cwts. As, however, these average results relating to increase include those of the ten-acre field, where, owing to the very high natural produce, the amount reckoned as increase due to sewage was comparatively small, it is probable that results equal at any rate to those of the five-acre field may be expected in the average of cases elsewhere; and where, as may frequently happen, a soil which yields a very small natural produce, may, nevertheless, owing to its physical qualities, be well adapted for the application of sewage and give large amounts of produce per acre under its influence, the amounts of increase for a given amount of sewage applied may be even considerably higher than those obtained in the five-acre field.

The general result is, that there was much more total produce per acre with 6,000 tons of sewage than with 3,000, and more still

with 9,000; but that the increase for a given amount of sewage applied was less with 9,000 tons than with 6,000, and less with 6,000 than with 3,000.

The increase in the amount of produce with each increase in the quantity of sewage applied appears proportionally greater when reckoned as green grass than as hay. This is due to the much greater succulence, and, therefore, less proportion of dry substance in the more highly sewaged and heavier crops. The question arises, whether, with a less proportion of dry substance in the sewaged grass, a given weight of that dry substance will have a greater or a less value as food for stock than an equal weight from the less succulent unsewaged grass? This point will be fully considered in subsequent Sections of the Report.

II. *Experiments with Italian Rye-grass.*

In April 1863 arrangements were made with Mr. Campbell for gauging the sewage applied, and weighing and sampling the produce obtained, in a field of Italian rye-grass, and also for trying the feeding qualities of the grass. From the field in question, a crop of tares, which had been manured with farm-yard dung, had been carried off in the spring of 1862. The land was then cleaned, again manured with stable and farm-yard dung, and sown down with rye-grass in September (1862); and, at the time of commencing the experiment in the following Spring, there was a promising and tolerably even crop.

Three plots of about an acre each were set apart; plot 1 to be unsewaged; plot 2 to receive sewage at the rate of 3,000; and plot 3 at the rate of 6,000 tons per acre per annum. So meagre was the flow, however, that up to the end of October (1863) only 787 tons had been applied to plot 2, and 1,522½ tons to plot 3, instead of 1,512 and 3,057 tons, respectively, that were required according to the rates intended, reckoning from the date of the first application in the Spring.

The particulars of the amounts of sewage applied, and of the amounts of produce and increase obtained, reckoned both as green grass and in the condition of dryness of hay, are given in Table V., p. 17. Further details will be found in Appendix, Table V., pp. 97–100.

TABLE V.—Amounts of Sewage applied, and of Produce and Increase obtained, in Experiments on Italian Rye-grass.

SEASON 1863.

	Without Sewage.	With Sewage.	
	Plot 1.	Plot 2.	Plot 3.
Sewage applied per Acre.			
		Tons.	*Tons.*
April	..	..	48·0
May	..	152·1	257·6
June	..	178·0	354·7
July	..	218·1	403·1
August	..	120·8	163·4
September	..	60·1	219·9
October	..	58·1	75·9
Total	..	787·2	1522·6

Rye-grass obtained per Acre, during each separate Month.

	Tons	*cwts.*	*qrs.*	*lbs.*	*Tons*	*cwts.*	*qrs.*	*lbs.*	*Tons*	*cwts.*	*qrs.*	*lbs.*
April	3	4	1	21	4	3	1	22	3	15	3	15
May	1	17	2	23	–	–	–	–	1	11	1	7
June	8	18	0	22	7	1	1	27	6	9	3	13
July	–	–	–	–	5	16	3	21	6	10	2	21
August	2	0	1	13	1	14	1	13	3	0	2	10
September	0	9	2	7	0	13	1	6	1	12	0	11
October	0	6	0	9	1	5	3	16	2	3	0	12
	16	16	0	19	20	15	1	21	25	3	2	5

Rye-grass obtained per Acre, in each successive Crop.

1st Crop	5	2	0	16	4	3	1	22	3	15	3	15
2d Crop	8	18	0	2	7	1	1	27	5	14	0	3
3d Crop	2	0	1	13	5	16	3	21	7	7	1	13
4th Crop	0	9	2	7	1	14	1	13	4	2	2	23
5th Crop	0	6	0	9	0	13	1	6	2	0	1	23
6th Crop	–	–	–	–	1	5	3	16	2	3	0	12
	16	16	0	19	20	15	1	21	25	3	2	5

Summary of Produce per Acre.

Green Grass	16	16	0	19	20	15	1	21	25	3	2	5
Reckoned as Hay*	4	18	3	8	5	5	0	16	5	12	2	11

Increase of Produce per Acre.

As Green Grass	..				3	19	1	2	8	7	1	14
Reckoned as Hay*	..				0	6	1	8	0	13		3

Increase for each 1,000 Tons of Sewage applied.

As Green Grass	..				5	0	2	25	5	9	3	17
Reckoned as Hay*	..				0	8	0	4	0	9	0	5

* The amount of hay to which the grass is equivalent is calculated by raising the amount of the experimentally determined perfectly dry or solid substance in the grass, in the proportion of from 84 to 100, on the assumption that the hay would contain 84 per cent. of dry substance and 16 per cent. moisture.

When the experiment with rye-grass was determined upon early in April, the grass was so far forward that it was found necessary to take a first cutting without sewage, before the

water-runs could be properly adapted for the separate irrigation of the respective plots, and hence but little sewage was applied before the end of April, and that little only on plot 3. The effect of the sewage was, therefore, as the second and third divisions of the Table show, to increase the produce chiefly during the later months and later crops of the season, and it did so very much in proportion to the amounts applied.

The total produce per acre was, without sewage (though otherwise pretty well manured), rather more than $16\frac{3}{4}$ tons, with 787 tons of sewage rather more than $20\frac{3}{4}$ tons, and with $1{,}522\frac{1}{2}$ tons of sewage nearly $25\frac{1}{4}$ tons of green grass; or, reckoned at a uniform condition of dryness as hay, the amounts were equivalent to 4 tons $18\frac{3}{4}$ cwts., 5 tons $5\frac{1}{4}$ cwts., and 5 tons $12\frac{1}{2}$ cwts. respectively. The increase of produce per acre was, therefore, nearly 4 tons of green grass due to the smaller, and about 8 tons $7\frac{1}{2}$ cwts. due to the larger application of sewage; though the increase in real dry substance represented only $6\frac{1}{4}$ cwts., and $13\frac{3}{4}$ cwts. of hay, respectively.

The increase reckoned for 1,000 tons of sewage in each case was, with the smaller quantity applied, 5 tons $0\frac{3}{4}$ cwts., and with the larger quantity, nearly 5 tons 10 cwts. of green grass; but the increase of real dry substance represented only 8 cwts., and 9 cwts. of hay, respectively. The increase in real dry or solid substance was, therefore, very small; but it will be seen further on that, at any rate in the case of the meadow grass (and it is probably the same with the rye-grass), a given amount of the dry substance of the sewaged produce was more productive of milk, and even slightly more of increase, than an equal amount of the dry substance of the unsewaged.

The general result is, that there was as much or more increase of green produce for 1,000 tons of sewage with the rye-grass than in most of the cases in the same season with the meadow-grass, where so very much larger quantities of sewage were applied, though the increase of dry substance reckoned as hay was generally the higher with the meadow-grass. That is to say, the comparatively large amounts of sewage applied to the meadow-grass gave, on the average, a larger amount of increase in dry or solid substance, for a given quantity of sewage, than the much smaller amounts applied to the rye-grass. It is also to be observed that there was a larger amount of increase, both of green grass and of dry substance reckoned as hay, for a given quantity of sewage on plot 3 with the larger, than on plot 2 with the smaller amount applied to the rye-grass. The facts point to the conclusion that, for the season in question, the larger quantity applied was below that required to yield the maximum increase for a given amount of sewage. It is obvious, however, that it may be advantageous even to pass this point; for, within certain limits, it will be economical to reduce the area and cost of distribution at the expense of a certain sacrifice of sewage.

It is to be regretted that the plant of rye-grass was so much injured by frost during the winter of 1863–4 (and it was the more

To face page 10.

TABLE VI.—Summary of the Results of the Feeding of Oxen on Unsewaged and Sewaged Meadow Grass alone, and with Oilcake in addition.

Seasons 1861 and 1862.

PLOTS, &c.	Consumed per Head per Day.				Consumed per 1,000 lbs. Live-weight per week.				Consumed to produce 100 lbs. Increase in Live-weight.				Increase in Weight per 1,000 lbs. Live-weight per Week.	Results calculated per Acre.						Results calculated per 1,000 tons sewage applied.			
	Fresh Food.		Dry Substance of Food.		Fresh Food.		Dry Substance of Food.		Fresh Food.		Dry Substance of Food.			Oilcake consumed with the Produce of each Acre.	Time the Produce of each Acre (with Oilcake, if any,) would keep 1 Ox.	Amount of Increase in Live-weight the Produce of each Acre would yield.		Value of Increase in Live-weight from each Acre at 4*d.* per lb.		Amount of Increase in Live-weight from the increased Produce from 1,000 tons Sewage.		Value of Increase in Live-weight from the increased Produce from 1,000 tons Sewage.	
	Grass.	Oilcake.	In Grass.	In Oilcake.	Grass.	Oilcake.	In Grass.	In Oilcake.	Grass.	Oilcake.	In Grass.	In Oilcake.				Including the Oilcake consumed (if any).	Exclusive of Oilcake.*	Including the Oilcake consumed (if any).	Exclusive of Oilcake.*	Including the Oilcake consumed (if any).	Exclusive of Oilcake.*	Including the Oilcake consumed (if any).	Exclusive of Oilcake.*
Season 1861; Period of Experiment 16 weeks, May 27—Sept. 15; Food—Meadow Grass.																							
	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs. ozs.	Lbs.	Weeks.	Lbs.	Lbs.	£ s. d.	£ s. d.	Lbs.	Lbs.	£ s. d.	£ s. d.
1. Unsewaged	89·8	..	23·7	..	576	..	152	..	23,669	..	6,246	..	2 7	..	33⅓	..	88	..	1 9 4	..	..	..	..
2. Sewaged														..	45⅓	..	134⅔	..	2 4 10	..	24¾	..	0 8 3
3. Sewaged	105·2	.	21·3	..	668	..	135	..	24,735	..	5,000		2 11	..	82⅔	..	245	..	4 1 8	..	35½	..	0 11 10
4. Sewaged														..	99⅔	..	297⅓	..	4 19 2	..	34	..	0 11 4
Season 1862; Reckoning the Period of Experiment from May 8—Oct. 13=22⅔ weeks†; Food—Meadow Grass and Oilcake.																							
1. Unsewaged	105·4	3·5	23·6	3·1	584	19·7	131	17·4	6,213	210	1,389	186	9 6	618½	24⅔	294½	209½	4 18 2	3 9 10	..	..	..	
2. Sewaged														1,766¾	70⅔	908¼	665	15 2 9	11 1 8	205¼	152¾	3 8 5	2 10 9
3. Sewaged	126·1	3·5	20·9	3·1	704	19·9	117	17·6	6,883	195	1,141	172	10 4	2,184¾	87⅓	1,123	822¾	18 14 4	13 14 3	138½	102½	2 6 1	1 14 1
4. Sewaged														2,056¾	82⅔	1,057½	774½	17 12 5	12 18 1	84¾	62¾	1 8 3	1 0 11
Season 1862; Reckoning the Period of Experiment from June 5—Oct. 13=18⅔ weeks‡; Food—Meadow Grass and Oilcake.																							
1. Unsewaged	100·9	3·7	23·9	3·3	535	19·5	127	17·2	8,489	310	2,010	274	6 5	668	25⅔	215½	120¾	3 11 10	2 0 3	..	..	..	..
2. Sewaged														1,868¾	72⅔	685¼	420¾	11 8 7	7 0 3	157½	100¼	2 12 5	1 13 5
3. Sewaged	123·2	3·7	20·9	3·3	658	19·7	112	17·4	9,115	273	1,549	241	7 4	2,310¾	9⅓	848	520¼	14 2 8	8 13 5	105½	66¾	1 15 2	1 2 3
4. Sewaged														2,175½	84⅔	798¼	489¾	13 6 1	8 3 3	64½	41	1 1 7	0 13 8

* The *value* of the increase in live-weight, "exclusive of oilcake," is reckoned by deducting the cost of the cake consumed, less the estimated value of the manure it yields, from the gross value inclusive of oilcake; and the *amount* of increase in live-weight, "exclusive of oilcake," by deducting from the gross increase with oilcake, at the rate of 1 lb. for every 4*d.* of deducted value. In further explanation it may be observed, that when the cheaper cakes, such as rape-cake or cotton-cake, were used, a very much larger proportion of the cost was chargeable against the manure, and therefore very much less against the animals, than when linseed-cake was employed. Such estimates are, however, obviously only approximations to the truth.

† This period includes the first three weeks during which the two oxen, otherwise fed on unsewaged grass, received sewaged grass.

‡ This period excludes the first month of the experiment, during three weeks of which the two oxen, otherwise fed on unsewaged grass, received sewaged grass.

so where the sewage had been the most liberally applied), that it was necessary to plough it up, otherwise the experiment would have been continued through the season of 1864. Instead of this, barley was sown over the three plots without any further manure, and it was obvious to the eye during growth that the crop was much heavier where sewage had been applied to the rye-grass than where it had not, and heavier where the larger than where the smaller quantity had been applied.

III. *Experiments with fattening Oxen.*

As in 1861, so in 1862, 10 oxen were purchased and tied up in a shed to consume the grass from the five acre field; two to be fed on unsewaged, and the remaining eight on sewaged grass; the latter to be cut, as ready, indiscriminately from the three sewaged plots. In 1861, the animals had grass alone for the first 16 out of the 20 weeks of the whole experiment, and they had oilcake in addition (four pounds per head per day) only during the concluding four weeks. The object was to try grass alone in the first season, and the result was very unfavourable. In 1862, oilcake was given in addition to the grass from the commencement, in quantity which, averaged over the whole period of nearly 23 weeks, amounted to about $3\frac{1}{2}$ lbs. per head per day.

The detailed records of the experiments in 1861 were given in the Appendix to the last Report, and those of the experiments of 1862 will be found in Tables VI. to VIII., pp. 101–108, in the Appendix to the present Report. Table VI. (opposite) summarises, and brings together at one view, the results obtained in 1861 on grass alone, and those in 1862, on grass with oilcake in addition. The upper division of the Table relates to the experiments of 1861; the middle one to the whole period of experiment of 1862, including the first four weeks during three of which the oxen professedly on unsewaged grass, had (for want of supply) sewaged grass; and the lower division represents the results exclusive of the first month. Inasmuch as both lots increased very much more during the first month than afterwards, the rate of increase on the whole would appear comparatively small if that period were omitted; whilst, including it, included also the period of three weeks during which the two oxen had sewaged grass. It was thought better, therefore, to give the results both ways. The comparison between the effects of the unsewaged and the sewaged grass is, however, much the same whichever period be adopted.

In both years a greater weight of the fresh sewaged grass was consumed per head per day, and per 1,000 lbs. live-weight per week, than of the less succulent unsewaged grass; but the dry or solid substance contained in the larger amount of sewaged grass consumed was less than that in the unsewaged. Again, when, as in 1861, grass was given alone, more of the sewaged than of the unsewaged, reckoned in the green or fresh state, was required to produce 100 lbs. increase in live-weight; though

the amount of dry substance contained in the sewaged grass so required was only about four fifths as much as that in the unsewaged grass. But when, as in 1862, a fair allowance of oilcake was given in addition, very much less both of fresh food and of dry or solid substance of food were required to produce 100 lbs. increase in live-weight than in 1861 with grass alone, and considerably less of the dry or solid substance of the more succulent sewaged than of the drier unsewaged grass was required.

It is also observable, that, reckoned in the green state, about the same amount both of the unsewaged and sewaged grass was consumed per 1,000 lbs. live-weight per week in 1862 with oilcake in addition, as in 1861 with grass alone; but the dry substance supplied in the grass consumed in 1862, with oilcake, was, both with the unsewaged and the sewaged grass, less than in 1861 without it.

The result in 1861, when cut grass was given alone, was extremely unsatisfactory, the amount of food required to produce a given amount of increase being unusually large, and the rate of increase on a given weight of animal within a given time unusually small. But when, in 1862, oilcake was given with the grass, and especially when given with the sewaged grass, very much better results were obtained. Indeed, in 1862, the rate of increase per 1,000 lbs. live-weight per week (if taken over the whole period of nearly 23 weeks) was, both with unsewaged and with sewaged grass (and oilcake in addition), about equal to the average obtained with animals of fair quality fed on good fattening food; but the food consumed for the production of 100 lbs. of increase, even in the case of the sewaged grass, contained more dry or solid substance than is usually required when oxen are liberally fed on oilcake, hay-chaff, and roots, and with the unsewaged grass considerably more. It should be borne in mind, however, that the experiment with unsewaged grass was on two animals only, whilst that with the sewaged was on eight, giving, therefore, a much more trustworthy average; and the results given in Appendix, Table VII. p. 107, show that one of the two oxen on unsewaged grass gave less increase than any of those on the sewaged, whilst the other gave considerably more than the average increase of the latter.

The general result is that the sewaged grass cut green and given to oxen tied up under cover, gave, when supplemented with a fair allowance of oilcake, a good average rate of increase in relation to the weights of the animals within a given time, and also a moderate rate of increase in relation to the amount of dry or solid substance provided in the food consumed.

It remains to say a few words on the last ten columns of Table VI.

It is seen that, by the aid of sewage, the time which an acre of land would provide food for an ox was increased three or more fold, varying according to the amount of sewage employed. Taking into account, however, the large amounts of oilcake consumed with the produce of each acre in 1862, it results

that (excepting on plot 2, where the produce was very much larger than in 1861) a given area would support considerably less stock in the cold and wet season of 1862 than in the more genial one of 1861.

The amount of increase in live-weight yielded from the produce of an acre was also increased several fold by means of sewage; about three-fold with the highest amount of sewage when the grass was consumed alone, and nearly four-fold in 1862, when oilcake was given in addition, in much about the same proportion to a given amount of the unsewaged and the sewaged grass.

It was shown in the last Report how very small was the gross money value of the increase in live-weight obtained from the consumption of the produce of an acre, or of the increased produce from 1,000 tons of sewage, when the grass was consumed alone, and the results then referred to are given in the upper division of the Table to compare with those in the lower divisions relating to 1862, when oilcake was also used. The result is seen to be, that the money value of the increase in live-weight from the produce of an acre of sewaged land, or from the produce of 1,000 tons of sewage, was very much greater in 1862, when oilcake was given, than in the corresponding cases in 1861 without it. The money return per acre was also from three to four times as great with sewage as without it, and although it is greater where 9,000 or 6,000 than where only 3,000 tons of sewage were applied, yet the return calculated, not per acre, but for each 1,000 tons of sewage, is, in each case, the less the greater the amount applied.

The next section of the Report will show that a very much higher money value was obtained both from an acre of land, and from a given amount of sewage, when the sewaged grass was employed for the production of milk instead of meat. But it may be mentioned that at Croydon, although the land is there more liberally sewaged than was the case in any of the Rugby experiments, satisfactory results have been obtained with fattening stock fed on the land. The practice there is, to irrigate for three or four days and nights together two or three times for each crop, and when the grass has got a sufficient head, to stop the application and turn the stock upon the land, where they remain until the grass is closely eaten down; they are then removed, the land is re-irrigated, and so on.

IV. *Experiments with Milking Cows.*

By the kindness of Mr. Campbell, experiments were made with his cows each year, 1861, 1862, and 1863, on the milk-yielding qualities of the grass.

In 1861, 12 of Mr. Campbell's cows were carefully selected and set apart to be fed on grass alone, 2 on unsewaged and 10 on sewaged grass, and the experiment was so conducted over a period of 16 weeks. It was afterwards continued for 4 weeks longer with an allowance of oilcake as well as grass.

In 1862, 3 cows were selected to receive oilcake and unsewaged, and 12 oilcake and sewaged grass, and the experiment was continued for 24 weeks.

In1863, 20 recently calved cows were selected, 5 to be fed on unsewaged meadow grass, 10 on sewaged meadow grass, and 5 on Italian rye grass. The design was to give each lot grass alone for the first 12 weeks, and afterwards a certain amount of oilcake in addition.

The detailed records of the experiments with cows in 1861 were given in the Appendix to the last Report; and those of the experiments in 1862 and 1863 will be found in Tables IX. to XIV., pp. 109–162, in the Appendix to the present Report. The results of all the experiments are given, in a condensed form, at one view, in Table VII. opposite.

Leaving the more detailed Tables for reference, to supply any further illustrations or explanations that may be needed, it will be sufficient to make a few comments on the main facts brought to view in the last-mentioned summary Table.

Reviewing the results of the experiments in which sewaged was tried against unsewaged meadow grass, it is observable that, excepting in the first season (1861), the cows required more both per head per day, and per 1,000 lbs. live weight per week, of the fresh or green sewaged than of the unsewaged grass; yet, the yield of milk, both per head and per 1,000 lbs. live weight, was, without exception, the greater with the unsewaged grass. The increase in live weight was also somewhat the greater on the unsewaged grass in 1861 and 1862, but the contrary was the case in 1863.

Reckoned in the fresh or green state in which it was cut and carted, there was, in fact, in every case but one (and then the quantities were equal), considerably less of the unsewaged than of the sewaged grass required to be consumed for the production of one gallon of milk. It should be remarked, however, that the unsewaged grass was generally cut in a much riper and less succulent condition, and therefore contained a considerably higher per-centage of dry or solid substance than the sewaged. It may be also here mentioned that in 1863 the cows having professedly unsewaged meadow grass, in default of a sufficient supply of it, had necessarily for a considerable part of each of the periods of 12 weeks unsewaged rye-grass.

Weight for weight, in the fresh or green state in which the grass was cut, weighed, and given to the cows, the unsewaged grass has, therefore, proved to be far more productive than the sewaged. But when the comparison is made, not between the amounts of grass reckoned in the fresh state, but between the amounts of dry or solid matter which the different descriptions of grass supplied, the result is that, in only one instance was there more, and in the others there was either an equal amount or even less of dry or solid substance of sewaged than of unsewaged grass required for the production of a given amount of milk.

The general result in regard to these points was, then, that in both milk and increase, but especially milk, a given weight of

To face page 22.

TABLE VII.—Summary of the Results of the Feeding of Cows on Unsewaged Meadow Grass, on Sewaged Meadow Grass, and on Italian Rye Grass (Unsewaged and Sewaged), each alone, and with Oilcake in addition.*

Seasons 1861, 1862, and 1863.

Plots, &c.	Consumed per Head per Day.				Consumed per 1,000 lbs. Live-weight per Week.				Consumed to produce 1 Gallon of Milk.				Milk per Head per Day.	Per 1,000 lbs. Live-weight per week.		Results calculated per Acre.†						Results calculated per 1,000 tons Sewage applied.†			
	Fresh Food.		Dry Substance of Food.		Fresh Food.		Dry Substance of Food.		Fresh Food.		Dry Substance of Food.							Amount of Milk the Produce of each Acre would yield.		Value of the Milk from the Produce of each Acre at 8d. per Gallon.		Amount of Milk from the increased Produce from 1,000 tons of Sewage.		Value of the Milk from the increased Produce from 1,000 tons of Sewage at 8d. per Gallon.	
	Grass.	Oil-cake.	In Grass.	In Oil-cake.	Grass.	Oil-cake.	In Grass.	In Oil-cake.	Grass.	Oil-cake.	In Grass.	In Oil-cake.		Milk.	In-crease (or Loss) in Weight.	Oilcake consumed with the Produce of each Acre.	Time the Produce of each Acre (with Oilcake, if any,) would keep 1 Cow.	Including the Oilcake consumed (if any).	Exclusive of Oilcake.‡	Including the Oilcake consumed (if any).	Exclusive of Oilcake.‡	Including the Oilcake consumed (if any).	Exclusive of Oilcake.‡	Including the Oilcake consumed (if any).	Exclusive of Oilcake.‡
Season 1861; Period of Experiment 16 weeks, May 26—Sept. 14; Food—Meadow Grass.																									
1. Unsewaged	Lbs. 150·2	Lbs. ..	Lbs. 35·8	Lbs. ..	Lbs. 994	Lbs. ..	Lbs. 237	Lbs. ..	Lbs. 62·2	Lbs. ..	Lbs. 14·8	Lbs. ..	Lbs. 24⅝	Lbs. 164¾	Lbs. 8·59	Lbs. ..	Weeks. 19	Gallons. ..	Gallons. 321⅜	£ s. d. ..	£ s. d. 10 14 3	Gallons. ..	Gallons. ..	£ s. d. ..	£ s. d. ..
2. Sewaged	124·0	..	22·7	..	846	..	155	..	62·2	..	11·4	..	20½	140¼	7·33	..	40⅝	..	570⅝	..	19 0 6	..	179¾	..	5 19 10
3. Sewaged																..	58⅝	..	820⅝	..	27 6 11	..	178	..	5 18 8
4. Sewaged																..	68⅞	..	961⅝	..	32 0 10	..	151⅜	..	5 0 11
Season 1862; Period of Experiment 24 weeks, May 2—Oct. 16; Food—Meadow Grass and Oilcake.																									
1. Unsewaged	127·2	3·5	25·2	3·1	862	23·8	171	21·1	55·5	1·53	11·0	1·36	23⅝	160	6·88	1,020½	41¼	666⅝	613¼	22 4 5	20 8 10	..	..	..	..
2. Sewaged	140·2	3·6	23·0	3·2	941	24·1	154	21·4	67·1	1·72	11·0	1·52	21⅛	144⅝	4·60	1,581¼	62⅜	920¼	835¼	30 13 8	27 16 10	84⅜	74	2 16 5	2 9 4
3. Sewaged																1,843¼	73⅝	1,072¾	973⅜	35 15 2	32 8 11	67⅜	60	2 5 2	2 0 0
4. Sewaged																1,814⅜	72⅞	1,056⅜	958¼	35 4 1	31 18 10	43¼	38⅜	1 8 10	1 5 7
Season 1863; First Period, 12 weeks, April 28—July 20; Food—Meadow Grass.																									
1. Unsewaged	99·1	..	27·9	..	650	..	183	..	36·2	..	10·2	..	28¾	185	4·37	..	21	..	402	..	13 8 0	..	..	..	..
2. Sewaged	142·9	..	25·2	..	933	..	169	..	52·2	..	9·2	..	28⅛	190	6·70	..	53⅞	..	1,019⅛	..	33 19 5	..	205¾	..	6 17 2
3. Sewaged																..	73⅜	..	1,404⅞	..	46 16 7	..	167⅞	..	5 11 5
4. Sewaged																..	80⅞	..	1,544⅛	..	51 9 5	..	126⅝	..	4 4 7
Season 1863; Second Period, 12 weeks, July 21—Oct. 12; Food—Meadow Grass and Oilcake.																									
1. Unsewaged	90·5	3·9	24·4	3·5	563	24·1	151	21·5	32·7	1·40	8·8	1·25	28¾	177½	1·82	623¼	23	444⅜	431¼	14 16 3	14 7 6	..	..	..	..
2. Sewaged	172·0	3·7	25·1	3·3	1,076	22·9	157	20·4	68·2	1·46	10·0	1·30	26	162½	2·02	1,134¼	44½	780	756¼	26 0 0	25 4 2	111⅜	108⅜	3 14 7	3 12 3
3. Sewaged																1,564½	61	1,075⅛	1,042⅝	35 16 9	34 14 11	105⅝	101⅞	3 10 1	3 7 11
4. Sewaged																1,719½	67	1,181⅛	1,145¼	39 7 9	38 3 10	81⅝	79⅛	2 14 7	2 12 11
Season 1863; Total Period, 24 weeks, April 28—Oct. 12; Food—First 12 weeks Meadow Grass, Second 12 weeks Meadow Grass and Oilcake.																									
1. Unsewaged	95·4	1·7	26·4	1·5	616	10·8	170	9·6	34·7	0·61	9·6	0·54	28⅜	183	3·23	255½	21⅜	419⅜	414	13 19 7	13 16 0	..	..	..	..
2. Sewaged	157·4	1·8	25·1	1·6	1,041	12·1	166	10·8	59·9	0·70	9·6	0·62	27½	179	4·39	620	48⅜	888½	875⅝	29 12 4	29 3 9	156⅜	153⅞	5 4 3	5 2 7
3. Sewaged																854½	66½	1,224½	1,206⅞	40 16 6	40 4 7	134¼	132⅛	4 9 6	4 8 1
4. Sewaged																939¼	73½	1,346¼	1,326⅛	44 17 5	44 4 4	103	101⅜	3 8 8	3 7 7
Season 1863; First Period, 12 weeks, April 28—July 20; Food—Italian Rye Grass.																									
1. Unsewaged	159·3	..	31·7	..	1,036	..	206	..	52·3	..	10·4	..	31⅜	204	6·03	..	33⅝	..	720	..	24 0 0	..	..	..	..
2. Sewaged																..	41⅝	..	889¾	..	29 13 3	..	215⅞	..	7 3 11
3. Sewaged																..	50⅞	..	1,078⅜	..	35 19 0	..	235⅛	..	7 16 11
Season 1863; Second Period, 12 weeks, July 21—Oct. 12; Food Italian Rye Grass and Oilcake.																									
1. Unsewaged	121·3	3·3	28·0	3·0	763	20·9	176	18·6	44·4	1·22	10·2	1·09	28⅜	177¼	−0·60	1,033	44⅜	848¼	827	28 5 6	27 11 4	..	..	..	..
2. Sewaged																1,276½	54⅝	1,048⅝	1,022½	34 18 11	34 1 5	254¼	247⅞	8 9 6	8 5 3
3. Sewaged																1,547¼	66⅞	1,270⅝	1,238⅝	42 7 1	41 5 11	277⅜	270⅝	9 4 11	9 0 3
Season 1863; Total Period, 24 weeks, April 28—Oct. 12; Food—First 12 weeks Italian Rye Grass, Second 12 weeks Italian Rye Grass and Oilcake.																									
1. Unsewaged	142·5	1·5	30·1	1·3	929	9·6	196	8·5	49·0	0·51	10·3	0·45	30	195¼	2·58	388¾	37⅝	768¼	760¼	25 12 2	25 6 10	..	..	..	..
2. Sewaged																480½	46⅝	949⅛	939⅜	31 13 0	31 6 5	230½	227⅞	7 13 5	7 11 11
3. Sewaged																582⅝	56⅞	1,150⅝	1,138⅝	38 7 3	37 19 3	251⅛	246⅝	8 7 5	8 5 9

* In the preparation of this Table the calculations are not based upon the results obtained during the whole of each of the "Periods" of experiment as above defined, those obtained during any part of a "Period" when, for want of a sufficient supply, the animals received any other than their proper description of grass, being as far as possible excluded. The exceptions so made relate chiefly to the experiments with unsewaged grass, the supply of which, as will be readily understood, was not so regular throughout the seasons as that of the sewaged; and hence it is, that the amounts of oilcake put down as consumed per head per day do not appear precisely the same for the cows on the unsewaged and those on the sewaged grass, although in point of fact the allowance, at parallel periods, and consequently throughout the whole period, was always the same for both.

† In the experiments with meadow grass in 1863, the produce of the two fields being employed indiscriminately as ready, the calculations are based upon the mean produce per acre, and increase per 1,000 tons of sewage, in the two fields.

‡ The *value* of the milk, "exclusive of oilcake," is reckoned by deducting the cost of the cake consumed, less the estimated value of the manure it yields, from the gross value inclusive of oilcake; and the *amount* of milk, "exclusive of oilcake," by deducting from the gross amount of milk with oilcake at the rate of one gallon for every 8*d.* of deducted value. In further explanation it may be observed, that when the cheaper cakes, such as rape-cake and cotton-cake, were used, a very much larger proportion of the cost was chargeable against the manure, and therefore very much less against the animals, than when linseed-cake was employed. Such estimates are, however, obviously only approximations to the truth.

animal was more productive when fed on unsewaged than on sewaged grass, and that a given weight of fresh unsewaged grass was more productive than an equal weight of fresh sewaged grass; but that a given weight of dry or solid substance supplied in sewaged grass was more productive than an equal weight supplied in unsewaged.

A careful consideration of the results leads to the conclusion that there was some considerable variation in the quality of the grass in the three different seasons. It was obviously very inferior in the wet and cold season of 1862. There is also evidence of a considerably diminished productiveness of a given weight both of green sewaged grass and of the dry substance of sewaged grass towards the end of the season; though part of the falling off which the figures show is doubtless attributable to the changing condition of the cows themselves as the season advanced.

The experiments do not afford the means of strictly comparing the productive qualities of rye grass with those of meadow grass, or of sewaged with those of unsewaged rye grass. Thus, as already alluded to, the cows professedly fed on unsewaged meadow grass in 1863 had, during a considerable part of the experimental period, unsewaged rye grass; whilst those fed on rye grass had indiscriminately the unsewaged and the sewaged. The indication is, however, that somewhat more of the dry substance of the sewaged rye grass than of the sewaged meadow grass was required to produce a given result; though the difference is less during the later than the earlier period of the season. It is probable, indeed, that sewaged Italian rye grass deteriorates less towards the end of the season than sewaged meadow grass.

It remains to indicate, approximately, the increased yield of saleable produce, and the money value of that produce, from an acre of land, and from 1,000 tons of sewage, according to season, and to the amount of sewage applied.

The last ten columns of Table VII. refer to these points. In explanation of the figures there given it should be stated, that the estimates of the amount, and value, of the milk yielded per acre, are, in the case of each plot, based upon the total amounts of grass obtained per acre throughout the season, and upon the average rate of consumption and yield of milk during each separate period, on unsewaged grass in the case of plot 1., and on the mixed sewaged grass in that of plots 2, 3, and 4; and the estimates are framed so as to show, as far as practicable, the amount and value, both inclusive and exclusive of oil-cake when it was given, as will be better understood by reference to the columns in the Table, and the foot note relating thereto.

It is obvious that such estimates can only be approximations to the truth. But such they are, and considered as such only, they are little likely to mislead any acquainted with practical agriculture, and with the limits within which such calculations are and are not of general application.

Referring first to the experiments with meadow grass, the result (excluding the case of 1862, when the unsewaged crop in the ten-

acre field was so very large) was, that the produce of an acre without sewage was competent to feed one cow for from 19 to 23 weeks, varying according to the season, or whether the grass were consumed alone or with oil-cake in addition. The same area was, with the aid of 3,000 tons of sewage, rendered capable of providing keep for two to two and a half cows for the same period of time; or, as represented in the Table, for one cow from two to two and a half times as long, with 6,000 tons of sewage for three to three and a half times as long, and with 9,000 tons from three and a half to four times as long.

Represented in quantity of milk, in 1861, when the sewage was not applied until the Spring, the produce per acre was, without sewage, 321½ gallons, and with the different amounts of sewage 570¾, 820½, and 961¼ gallons, respectively. Reckoned according to the rate of consumption of grass and of the yield of milk during the first 12 weeks, or most favourable period, of the grass season of 1863, when, as in 1861, the grass was consumed alone, but unlike 1861 the sewage had been applied throughout the winter months, and when the cows being mostly newly calved were also in their most favourable condition, the estimated yield of milk reckoned upon the total produce of grass per acre was, without sewage 402 gallons, and with the different amounts of sewage 1,019, 1,404¾, and 1,544 gallons, respectively; or, so far as the sewaged plots were concerned, from one-half to two-thirds more per acre than in 1861 reckoned according to the rates of consumption and yield of milk over the whole of that season.

With the aid of the large quantities of oilcake stated in the Table, the yield of milk per acre in 1862, when the season was very favourable for the unsewaged but comparatively unfavourable for the sewaged land, was, without sewage 666½ gallons, and with the different amounts of sewage 920½, 1,072¾, and 1,056 gallons; and, according to the rates of consumption and yield of milk when oilcake was given during the latter half of the season of 1863, the yield of milk per acre calculated upon the total produce of grass throughout the season in each case was, without sewage 444¼ gallons, and with the different amounts of sewage 780, 1,075, and 1,181½ gallons respectively.

The general result is, that, on the sewaged plots, the yield of milk was at a less rate per acre with oilcake during the latter or inferior part of the season of 1863, than without it during the earlier or more favourable portion of the same season; but it was at much the same rates per acre during the latter or inferior part of the comparatively favourable season of 1863, as during the entire period of the unfavourable season of 1862. Lastly, on this point, the yield of milk per acre over the entire season of 1863, half without and half with oilcake, was higher than that of 1862 with oilcake throughout, and considerably so on the more highly sewaged plots.

So far as may be judged from the limited experience which these results record, it would appear probable that with an average supply of about 5,000 tons of sewage per acre per annum to meadow

land, and with cows taken indiscriminately at various periods after calving, an average of not less than 1,000 gallons of milk per acre might be expected; or more than this when cows are taken at their best, and the season and other circumstances are more than usually favourable.

In the case of the experiments with rye-grass much less sewage was applied than is above assumed, and the results relate to the experience of one season only, which was not only a comparatively favourable one for the action of sewage, but, being the first year of growth after sowing down, was also favourable so far as the condition of the crop was concerned. The indication is, however, that with Italian rye-grass a larger yield of milk per acre may be obtained, for the application of a given amount of sewage, than with meadow grass. But with Italian rye-grass the land has to be periodically broken up, during which time less sewage per acre, if any, can be utilized, and hence, for the distribution of a given amount of sewage, the expense of laying down a much larger area would be necessary so far as this crop were introduced. On the other hand, the advantage of the practice would be, that other crops, for which the direct application of sewage is less appropriate than to grass, would be intermediately grown, either relying upon the residue of sewage manuring remaining in the broken up land, or by means of the solid manure derived from the consumption of the sewaged grass. In either case, therefore, such produce would be obtained indirectly by means of sewage.

Bearing in mind the varying conditions of the several experiments, the differences which the Table shows in the estimated value of the milk yielded from the produce of each acre ostensibly receiving the same amount of sewage will be intelligible, and it will not be necessary to call attention to the figures in detail. The results taken as a whole lead to the conclusion that the gross money return per acre, reckoned in milk at 8*d.* per gallon, might be estimated at certainly not less than 30*l.* to 35*l.* with an application of about 5,000 tons of sewage per acre per annum.

No allowance can be made for the value of the increase in weight in the case of cows, for at the end of their milking period, even though some may gain in weight considerably, they are certainly, on the average, of less money value than at the beginning, so that a deduction rather than an addition should be made on the score of the difference in value of the animals themselves, at the end as compared with the beginning of their milking period.

The last four columns of Table VII. show the estimated yield of milk, and the value of the milk at 8*d.* per gallon, from the increased produce of 1,000 tons of sewage in the different experiments; and the estimates are given both inclusive and exclusive of oilcake (if any) as before referred to.

In 1861, when the sewage was not applied until the Spring, and less had therefore to be reckoned as contributing to the increase obtained, nearly 180 gallons of milk are estimated to be

obtained for each 1,000 tons of sewage. when the amount actually applied had not exceeded 3,000 tons, and the rate per annum not 5,000. Again, reckoned according to the yield of milk for a given amount of grass consumed during the first 12 weeks, or the most favourable half, of the season of 1863, the increased yield of milk for each 1,000 tons of sewage was 205¾ gallons with 3,000, 167 gallons with 6,000, and only 126¾ gallons with 9,000 tons of sewage per acre per annum. According to the results obtained with rye grass during the same 12 weeks of the season of 1863, the yield was even somewhat better than in the most favourable case with the meadow grass, and it is the better the larger the quantity of sewage, which, however, was not applied until the Spring, and, owing to deficiency of supply, little exceeded 1,500 tons per acre.

Owing to the very large produce without sewage in 1862, and to the unfavourable character of the season for the action of sewage, the increased yield of milk estimated as due to 1,000 tons of sewage, even with the addition of a considerable amount of oilcake, was very small; much smaller, indeed, than in the more favourable seasons without the oilcake. It was also smaller with oilcake during the latter half of the season of 1863, than without it during the former half, when the quality of the grass, and the condition of the cows, were both so much more favourable. Even taking the whole of the comparatively favourable season of 1863, half without and half with oilcake, but when winter supply of sewage had to be reckoned against the produce, the estimated increased yield of milk for each 1,000 tons of sewage applied was consideraly less than in 1861 without oilcake, but when no winter supply of sewage had to be reckoned against the yield.

With rye-grass, unlike the meadow grass, the yield of milk for a given amount of sewage was greater during the latter part of the season with oilcake, than during the earlier or more favourable part without it. As before observed, it would appear that rye-grass does not deteriorate so much as meadow grass as the season advances.

In 1861, when no winter supply of sewage had to be reckoned against the increase, and the grass was consumed without oilcake, the estimated value of the milk obtained for each 1,000 tons of sewage applied was between 5*l.* and 6*l.* In 1863, according to the yield of milk for a given amount of grass during the first half of the season, without oilcake, the value for each 1,000 tons of sewage was, with 3,000 tons more, but with 6,000 and 9,000 tons less, than in 1861; and, reckoned according to the yield during the latter half of the season, it was, even with oilcake, little more than half as much as according to that during the earlier half; and in the unfavourable season of 1862, also with oilcake, it was even less still. Taking the whole of the comparatively favourable season of 1863, half without and half with oilcake, the return for each 1,000 tons of sewage, reckoned in milk at 8*d.* per gallon, was rather over 5*l.* when only 3,000 tons were applied, one seventh less when 6,000 tons, and one third less when 9,000 tons were employed.

With the rye-grass the estimated money return, for a given amount of sewage applied, was considerably higher than with the meadow grass; but it must be borne in mind that there was no winter supply of sewage to reckon against the produce, and that the results relate both to the first and most productive year of the growth of the crop, and to a favourable season for the application of sewage.

Excepting in the cases of the rye grass, and of the meadow grass in 1861, in neither of which had there been any winter supply, there was a very marked diminution in the money return for a given amount of sewage where the largest quantities were applied. The practical question suggests itself — what is approximately the limit of maximum yield for a given amount of sewage which is attainable without so far increasing the area, and consequently the cost of distribution, as to more than counterbalance the increased return? Special reference will be made to this point further on. But it may be here observed that, so far as these results give the means of judging, it would appear that an average of about 5*l.* increased value of milk, reckoned at 8*d.* per gallon, may be anticipated from the application of each 1,000 tons of sewage when the amount applied does not exceed about 5,000 tons per acre, per annum. This would be equivalent to a *gross* value of increased produce of milk of rather more than 1*d.* for every ton of sewage applied.

V. *Composition of the Rugby Sewage Water.*

From the commencement of the Rugby experiments, samples of sewage have been collected for analysis at short intervals in each of the two fields. The plan was, to take about a quart from the gauge tank in the field, holding about $3\frac{1}{4}$ tons, at intervals of about two hours for as many days in the week as the sewage was applied; and at the end of the week, after well shaking the mixture, a one or two gallon sample was sent to Professor Way for analysis.

In 1861, twelve such samples from each field, representing the supply for the seven months of April to October inclusive, were taken and submitted to analysis.

The season of 1862 is reckoned to include the months from November 1861 to October 1862 inclusive. During each month from November 1861 to April 1862 inclusive only one sample was taken from each field, during May two, during June one, and during July, August, September, and October, two were taken; thus making a total of 17 samples from each field to represent the sewage supplied during the season.

In like manner the season of 1863 was reckoned to include the period from November 1862 to October 1863 inclusive. From November 1862 to March 1863 inclusive two samples of sewage were taken in each month in each field; in April one only in each field, and in May two in the 5-acre, and one only in the 10-acre field. From this date, namely, during June, July, August, September, and October, a different plan of collection

was adopted. During two weeks in each of these months (as a rule the first and third) a sample was taken every two hours from the gauge-tank in whichever field the sewage was being applied, and at the end of the week the samples from the two fields were well mixed, and a portion of the mixture sent off for analysis, as representing the sewage of that week, without distinction as to the field in which it was collected.

The results of each of the 24 analyses of the sewage representing the season ending October 1861 were given in the Appendix (and a summary of them was given in Table VI.) in the previous Report; those of the 34 for the season ending October 1862 are given in Tables XV. to XVII., and those of the 35 relating to the season of 1863 ending October 1863, in Tables XVIII. to XXI., pp. 163–169, in Appendix No. 1. in the present Report.

Leaving the details for reference it will be sufficient to give in this place the summary view of the composition of the sewage which Tables VIII. and IX. (pp. 29 and 30) present; in the former of which is given the average grains per gallon, and in the latter the average lbs. per 1,000 tons, of the different constituents, in the sewage from each field, in each of the three seasons, respectively.

Table VIII.—Average Composition of the Rugby Sewage, supplied in each Field, in 1861, 1862, and 1863

Grains per Gallon.

Constituents.		Season 1861; April to October.		Season 1862; November 1861 to October 1862.		Season 1863; November 1862 to October 1863.		General Means of			
		5-acre Field; 12 Samples.	10-acre Field; 12 Samples.	5-acre Field; 17 Samples.	10-acre Field; 17 Samples.	5-acre Field; 23 (1) Samples.	10-acre Field; 22 (2) Samples.	24 Samples; April to October 1861.	34 Samples; November 1861 to October 1862.	35 (3) Samples; November 1862 to October 1863.	93 Samples; April 1861 to October 1863.
Organic matter	In solution	10·26	10·30	8·42	7·98	8·35	8·29	10·28	8·20	7·92	8·63
	In suspension	16·75	11·57	16·71	16·96	27·35	25·99	14·16	16·84	24·03	18·85
	Total	27·01	21·87	25·13	24·94	35·70	34·28	24·44	25·04	31·95	27·48
Inorganic matter	In solution	36·82	35·85	35·00	33·83	39·57	38·77	36·34	34·42	36·80	35·81
	In suspension	16·18	12·55	21·31	20·42	39·41	34·93	14·36	20·86	34·45	24·30
	Total	53·00	48·40	56·31	54·25	78·98	73·70	50·70	55·28	71·25	60·11
Total in solution		47·08	46·15	43·42	41·81	47·92	47·06	46·62	42·62	44·72	44·44
Total in suspension		32·93	24·12	38·02	37·38	66·76	60·92	28·52	37·70	58·48	43·15
Total solid matter		80·01	70·27	81·44	79·19	114·68	107·98	75·14	80·32	103·20	87·59
Ammonia	In solution	4·99	4·98	4·45	4·51	5·83	5·69	4·98	4·48	5·22	4·89
	In suspension	1·65	1·18	1·45	1·48	2·08	1·98	1·41	1·47	1·86	1·60
	Total	6·64	6·16	5·90	5·99	7·91	7·67	6·39	5·95	7·08	6·49

(1) 13 Samples exclusively from the 5-acre Field, and 10 of mixtures from the 5-acre and the 10-acre Fields.
(2) 12 Samples exclusively from the 10-acre Field, and 10 of mixtures from the 5-acre and the 10-acre Fields.
(3) 13 Samples exclusively from the 5-acre Field, 12 from the 10-acre Field, and 10 of mixtures from the two fields.

Table IX.—Average Composition of the Rugby Sewage, supplied in each Field, in 1861, 1862, and 1863.

Lbs. per 1,000 Tons.

Constituents.	Season 1861; April to October.		Season 1862; November 1861 to October 1862.		Season 1863; November 1861 to October 1863.		General Means of			
	5-acre Field; 12 Samples.	10-acre Field; 12 Samples.	5-acre Field; 17 Samples.	10-acre Field; 17 Samples.	5-acre Field; 23 (1) Samples.	10-acre Field; 22 (2) Samples.	24 Samples; April to October 1861.	34 Samples; November 1861 to October 1862.	35 (3) Samples; November 1862 to October 1863.	93 Samples; April 1861 to October 1863.
Organic matter - In solution	328·3	329·6	269·5	255·4	267·2	265·3	329·0	262·4	253·4	276·2
Organic matter - In suspension	536·0	370·2	534·7	542·7	875·2	831·7	453·1	538·9	769·0	603·2
Organic matter - Total	864·3	699·8	804·2	798·1	1142·4	1097·0	782·1	801·3	1022·4	879·4
Inorganic matter - In solution	1178·2	1147·2	1120·0	1082·6	1266·2	1240·6	1162·9	1101·4	1177·6	1145·9
Inorganic matter - In suspension	517·8	401·6	681·9	653·4	1261·1	1117·8	459·5	667·5	1102·4	777·6
Inorganic matter - Total	1696·0	1548·8	1801·9	1736·0	2527·3	2358·4	1622·4	1768·9	2280·0	1923·5
Total in solution	1506·5	1476·8	1389·5	1338·0	1533·4	1505·9	1491·9	1363·8	1431·0	1422·1
Total in suspension	1053·8	771·8	1216·6	1196·1	2136·3	1949·5	912·6	1206·4	1871·4	1380·8
Total solid matter	2560·3	2248·6	2606·1	2534·1	3669·7	3455·4	2404·5	2570·2	3302·4	2802·9
Ammonia - In solution	159·7	159·4	142·4	144·3	186·6	182·1	159·4	143·4	167·0	156·5
Ammonia - In suspension	52·8	37·7	46·4	47·4	66·5	63·4	45·1	47·0	59·5	51·2
Ammonia - Total	212·5	197·1	188·8	191·7	253·1	245·5	204·5	190·4	226·5	207·7

(1) 13 Samples exclusively from the 5-acre Field, and 10 of mixtures from the 5-acre and the 10-acre Fields.
(2) 12 Samples exclusively from the 10-acre Field, and 10 of mixtures from the 5-acre and the 10-acre Fields.
(3) 13 Samples exclusively from the 5-acre Field, 12 from the 10-acre Field, and 10 of mixtures from the two fields.

As the ammonia contributes about three fourths of the estimated money value of the constituents of town sewage, and as its amount is the best index to that of the associated constituents valuable as manure, and also to the relation of population to quantity of sewage, its proportion is of great importance to consider.

Tables VIII. and IX. show that, according to the mean of all the analyses for the entire season in each case, there was comparatively little difference in the amounts either of ammonia, or of total matters in solution, in the sewage from the two fields. The difference in the amounts of suspended matter was, however, more considerable.

Comparing the composition of the sewage of one season with that of another, as indicated by the mean result of all the analyses relating to each, it is seen that the amounts of ammonia, and total matter in solution, are less in the comparatively wet season of 1861–2, than in either of the others, whilst the ammonia is the highest in the dry season of 1862–3. As no samples were analysed during the winter of 1860–61 when the sewage was probably weaker than during the remaining portions of the season, it might be concluded that the mean of the analyses for 1861 would give too high an average composition; but, on the other hand, there were fewer analyses during the months of August, September, and October, when the sewage was comparatively strong, than during the five preceding months when it averaged much weaker, which, of course, would tend to reduce the mean. It is probable, therefore, that the mean of the analyses for 1861 gives a pretty fair indication of the composition of the sewage for that season. With regard to 1862, there were fewer analyses during the months when the sewage averaged the strongest, and hence, the mean of the results for that season probably indicate somewhat too low an average composition. Lastly, in the season of 1863, there were again fewer analyses relating to the periods when the sewage was strongest, and hence the mean of the results for that season also probably indicates somewhat too low a composition. There can be little doubt, however, that the sewage of the wet season of 1862 was the weakest, that of 1861 somewhat stronger, and that of the dry season of 1863 stronger still.

It is obvious that the variations in the composition of sewage must depend chiefly upon its state of dilution, and that the state of dilution must be very much influenced by the rainfall. An inspection of the Tables in the Appendix, above referred to, will show how extremely different was the composition at one time compared with another, notwithstanding the general agreement of the average results as between one field and the other, or between one season and another. The great variation in the composition according to circumstances is strikingly illustrated in the following Table X.; and it is the more remarkable when it is borne in mind that every sample analysed was a mixture of portions taken every few hours throughout the day for several days together:

TABLE X.—Showing the highest, lowest, and average Amounts of Ammonia, and total solid matter, in mixed Samples of Sewage, collected at different Periods in each of the three Seasons.

		Ammonia.		Total solid matter.	
		Grains per Gallon.	lbs. per 1,000 Tons.	Grains per Gallon.	lbs. per 1,000 Tons.
1861	Highest	15·64	500·5	216·5	6928
	Lowest	2·99	95·7	37·6	1203
	Mean of 24 analyses	6·39	204·5	75·1	2405
1861–2	Highest	11·38	364·2	129·3	4138
	Lowest	2·55	81·6	50·5	1616
	Mean of 34 analyses	5·95	190·4	80·3	2570
1862–3	Highest	12·81	409·9	269·9	8637
	Lowest	3·14	100·5	62·2	1989
	Mean of 35 analyses	7·08	226·5	103·2	3302

Thus, the amount of ammonia, which to such a great extent rules the estimated money value of the sewage, varied at different times during the 31 months to which the samples refer, from about $2\frac{1}{2}$ to about $15\frac{1}{2}$ grains per gallon, or from $81\frac{1}{2}$ to $500\frac{1}{2}$ lbs. per 1,000 tons; and the total solid matter varied from about $37\frac{1}{2}$ to about 270 grains per gallon, or from 1,203 to 8,637 lbs. per 1,000 tons. It will be obvious from these results how valueless for the purposes of determining the average composition of the sewage of any locality—indeed, how utterly misleading—must be the analyses of samples taken without due regard to the circumstances by which its composition is so materially affected.

Although the sewage of 1862–3 was considerably richer in valuable constituents than that of the wetter season of 1861–2, yet the mean of the whole 93 analyses relating to the sewage of the three seasons indicates a composition closely agreeing, in all essential points, with that adopted in the previous report according to the results then obtained relating to the season of 1861 alone. For reasons explained above, however, the real average composition of the sewage of the period was probably somewhat higher than is indicated by the direct numerical mean of the 93 analyses. The latter gives—

	Grains per gallon.	Lbs. per 1,000 tons.
Total solid matter	87·6	2,803
Ammonia	6·5	208

From a careful consideration of the circumstances alluded to it is concluded that the average sewage of the 31 months would more nearly contain as follows—

	Grains per gallon.	Lbs. per 1,000 tons.
Total solid matter	92·5	2,960
Ammonia	7·0	224

Assuming this to represent the average composition of the Rugby sewage during the period in question, 1,000 tons may be estimated to contain nitrogen reckoned as ammonia equivalent to that con-

tributed in the mixed excrements, and associated matters, of between 17 and 18 persons of a mixed population of both sexes and all ages in a year, or to that in between 11 and 12 cwts. of Peruvian guano.* In other words, about 1,700 tons of such sewage would contain nitrogen reckoned as ammonia equal to that in 1 ton of Peruvian guano. Yet it has been seen that the increase of grass obtained by the use of 1,000 tons of this sewage did not, under the most favourable circumstances, exceed that which would correspond to about 26 cwts. of hay, and was on the average much less. To this question of the amount of produce obtained for a given amount of manurial constituents applied further reference will be made.

Before leaving the subject of the composition of the Rugby sewage, attention should be directed to one or two other points.

In Table XI. are given the results of the analyses of samples of sewage collected in each of the two fields, every two hours from 7 a.m. to 5 p.m., on April 16, 1861. It is seen that the amounts of both total solid matter and ammonia were the least in the samples collected early in the morning, the greatest during the middle of the day, and diminished towards the evening. As, however, the samples were not taken at the outfall as the sewage came from the town at the respective hours, but after it had been pumped from the main tank in which it was being collected and mixed throughout the day as it was produced, the variations in composition at the different periods are not so striking as have been observed when samples have been collected directly from the outfall at different periods of the day.

TABLE XI.

SHOWING the COMPOSITION of SAMPLES of the RUGBY SEWAGE collected at different hours of the day, on April 16, 1861.

		Per Gallon.			
		Organic matter.	Inorganic matter.	Total solid matter.	Ammonia.
		Grains.	Grains.	Grains.	Grains.
7 A.M.	Five-acre Field	14·30	38·50	52·80	2·74
	Ten-acre Field	14·40	38·90	53·30	2·89
9 A.M.	Five-acreField	20·50	39·80	60·30	4·71
	Ten-acre Field	20·20	47·20	67·40	3·51
11 A.M.	Five-acre Field	21·90	38·00	59·90	5·14
	Ten-acre Field	22·70	39·60	62·30	5·39
1 P.M.	Five-acre Field	20·10	36·40	56·50	4·82
	Ten-acre Field	25·20	41·60	66·80	5·74
3 P.M.	Five-acre Field	21·10	34·10	55·20	4·55
	Ten-acre Field	21·50	35·30	56·80	4·69
5 P.M.	Five-acre Field	22·00	35·80	57·80	4·32
	Ten-acre Field	20·30	37·50	57·80	4·37

* The rainfall of the period of the experiments, and, therefore, the dilution of the sewage, was, however, less than the average, according to which it is estimated that, with the present arrangements, 1,000 tons would represent the excretal matters of scarcely 17 average individuals, and the ammonia of scarcely 11 cwts. of Peruvian guano. (See pp. 44–45, and 76.)

Another point to which reference should be made is as to the amounts of phosphoric acid and potass in the sewage, and the relation of these to the ammonia (or nitrogen) associated with them; for it is obviously important to consider whether or not the mineral or incombustible constituents of sewage exist in it in sufficient proportion to the ammonia or nitrogen for the requirements of the crops to be grown; and as the phosphoric acid and potass (the one or the other or both according to circumstances) are, perhaps, the mineral constituents the most likely to be deficient relatively to the nitrogen, the proportion of them to the latter in the sewage, and in various crops, may appropriately be referred to in illustration of the point in question.

Table XII. shows the number of grains per gallon, of ammonia, phosphoric acid, and potass, and the relation of the phosphoric acid and the potass to one of nitrogen, in the few cases only in which the phosphoric acid and potass were determined in the Rugby sewage.

Table XII.

Particulars of the Samples.		Per Gallon.			Proportion to 1 Nitrogen.	
When collected.	Where collected.	Ammonia.	Phosphoric Acid.	Potass.	Phosphoric Acid.	Potass.
		Grains.	Grains.	Grains.		
April 1–6, 1861	Five-acre field	2·99	0·64	0·86	0·26	0·35
„ 1–6, „	Ten-acre field	4·69	0·70	0·61	0·18	0·16
„ 29,—May 4, 1861	Five-acre field	5·08	1·09	1·37	0·26	0·33
„ 29,— „ 4, „	Ten-acre field	5·64	1·28	1·29	0·28	0·28
Nov. 4–6, 1861	Five-acre field	10·91	2·14	4·95	0·24	0·55
„ 5, „	Ten-acre field	11·38	2·39	4·63	0·26	0·49
Dec. 17–18, „	Five-acre field	9·30	1·53	3·28	0·20	0·43
„ 17, „	Ten-acre field	7·67	1·15	3·40	0·18	0·54
July 6–11, 1864	Another field.	8·66	3·12	3·84	0·44	0·54
„ 13–18 „	Another field	8·78	2·80	3·90	0·39	0·54
	Average	7·51	1·68	2·81	0·27	0·42

It is seen that when the sewage was poor in ammonia it was also poor in phosphoric acid and potass, and when rich in ammonia rich in phosphoric acid and potass. In the case of neither constituent, however, is the relation to one of nitrogen the same in all the samples; though the correspondence is perhaps quite as close as could be expected when the circumstances which rule the amount of each are taken into consideration.

By far the larger proportion of the ammonia (or nitrogen) exists in solution in the sewage, so that if the sample taken did not contain its fair proportion of suspended or sedimentary matter, the amount of ammonia would not be very materially affected thereby. Of the phosphoric acid, on the other hand, a much larger proportion exists in the suspended matter, so that if the agitation in the main tank were incomplete, the pumps worked sluggishly, or the mixing in the gauge-tank in the field before taking the sample were insufficient, the proportion of suspended matter in the sample analysed might be too small, or under other conditions it might be too large. Hence, although the phosphoric acid must bear a pretty constant proportion to the nitrogen in sewage, if

great care be not taken in the sampling, analysis may show considerable variation in the amount, and in the proportion to the nitrogen, in samples taken at different times. It was, in fact, the case, that in the instances among those to which Table XII. refers in which the amount of phosphoric acid, and its proportion to the nitrogen, were the highest, there also was the largest amount of sedimentary matter in the sewage.

Again, the potass exists exclusively in the solution, so that if its proportion to the ammonia were constant in sewage, any deviation from the exactly due proportion of sedimentary matter in the sample taken would comparatively little affect the indications of analysis in regard to it. But whilst the phosphoric acid of sewage may be said to be derived exclusively from food-refuse and excretal matters, and therefore necessarily to bear within comparatively narrow limits a pretty uniform relation to the nitrogen, the amount of potass will vary very much according to locality, and be considerably greater where the streets or roads are constructed of potass minerals (as granite) than elsewhere.

According to the average result obtained upon the analysis of ten different samples of the Rugby sewage there were, as is shown in the bottom line of Table XII., 0·27 parts of phosphoric acid, and 0·42 parts of potass, to 1 of nitrogen in the sewage; or, in other words, for 100 of nitrogen in the sewage there were 27 parts of phosphoric acid, and 42 parts of potass. The question arises—what are the proportions of the phosphoric acid and potass to the nitrogen in different crops? These vary considerably for the same description of crop according to circumstances, but the figures given in the following Table (XIII.) may be taken to represent approximately the average proportions.

Table XIII.

	Proportion to 1 Nitrogen.					
	Phosphoric Acid.			Potass.		
	In Corn, Roots, &c.	In Straw, Leaves, &c.	In Total Produce.	In Corn, Roots, &c.	In Straw, Leaves, &c.	In Total Produce.
Wheat	0·48	0·42	0·46	0·28	1·08	0·57
Barley	0·40	0·34	0·38	0·34	1·26	0·60
Oats	0·28	0·37	0·30	0·25	1·55	0·65
Meadow Hay	..	..	0·27	..	..	1·00
Clover Hay	..	..	0·23	..	..	0·52
Beans	0·25	0·46	0·30	0·32	1·23	0·50
Mangolds	0·17	..	..	1·00	..	..
Swedes	0·27	0·16	0·21	0·82	0·44	0·63
Common Turnips	0·28	0·18	0·26	1·60	0·71	1·17
Potatoes	0·42	..	..	1·23	..	..

Thus, according to this Table, meadow hay contains on the average 0·27 parts of phosphoric acid to 1 of nitrogen, and according to the average result obtained on the analysis of the ten samples of the Rugby sewage it contained exactly the same proportion. Of potass, on the other hand, whilst meadow hay contains 1 part, the sewage only contained 0·42 parts to 1 of nitrogen.

According to these figures, if on the application of sewage to meadow land the whole of the nitrogen supplied were recovered in the increase of produce, it is obvious that there would be associated with it in the manure almost exactly the amount of phosphoric acid, but less than half the amount of potass, required by the crop. But in practice considerably less nitrogen is recovered in the increase of crop than is supplied in the manure employed to produce it. Then, again, the dry or solid substance of sewaged grass, as it is generally cut, contains a considerably higher per-centage of nitrogen than that of ordinary meadow grass as cut for hay; whilst, from the results of direct experiments made on the point, it is probable that the proportion of phosphoric acid to 1 of nitrogen is somewhat lower, and that of potass somewhat higher, in sewaged grass than in ordinary meadow hay. It follows, that if the relation of the phosphoric acid and potass to the nitrogen in sewage be fairly represented by the average result of the few analyses given on the point, it would contain more phosphoric acid, though perhaps not so much potass as could be turned to the account of growth under the influence of the amount of nitrogen at the same time supplied.

Of phosphoric acid at any rate there would probably be an accumulation within the soil, rather than an exhaustion of it, by the use of sewage to grass land. Still, agricultural experience shows that an apparently excessive supply of phosphoric acid is frequently useful in giving a favourable development, or tendency of growth, to a plant; and in this way it is possible that the application of phosphatic manures in conjunction with sewage might be advantageous. As above stated, the proportion of the potass to the nitrogen in town sewage would vary considerably according to locality; and where there was no other source of it than food-refuse and the excretal matters of man and animals, it would be more likely than the phosphoric acid to be in relative defect in case of the constant application of the sewage to grass land.

In corn crops, such as wheat or barley, the proportion of phosphoric acid to nitrogen is much higher than in meadow hay, and much higher also than was found in the Rugby sewage. The average proportion in the sewage was, however, not deficient compared with that of the phosphoric acid in these crops to the amount of nitrogen which in common practice is required to be supplied in manure, to yield one of nitrogen in the form of increased produce. Of potass, the proportion to 1 of nitrogen in

these crops is, in the grain, which alone is generally sold off the farm, considerably less than was found on the average in the Rugby sewage. In fact, if town sewage were used on any comprehensive scale to corn crops grown in rotation, phosphoric acid would be more likely to become deficient than potass in the majority of soils; but if phosphatic manures were employed for other crops of the course, they would not need to be supplemented to the sewage for corn. It is, indeed, well known that phosphatic manures are in practice much more used, and are much more effective, for root than for corn crops, yet, as the Table shows, the proportion of phosphoric acid to 1 of nitrogen is lower in the root than in the corn crops.

Without further comments on the figures given in Tables XII. and XIII., it may be stated, in general terms, that a careful consideration of the subject leads to the conclusion that potass would be more likely than phosphoric acid to become deficient where town sewage was applied constantly to meadow land, whilst phosphoric acid would be more likely to become deficient than potass where it was applied to the ordinary crops of rotation.

VI. *Estimated Average Composition of the Metropolitan Sewage.*

It will be well to offer a few observations here on the evidence at command relating to the average composition of the Metropolitan sewage, and to the estimated money value, according to trade prices, of its manurial constituents.

In our former Report attention was called to the fact that, so far as it was then sampled and analysed, the Rugby sewage showed an average composition agreeing very closely with that calculated for the Metropolitan sewage, according to the analyses by Dr. Letheby of samples, taken at noon and midnight respectively, from 10 different sewers; and, as above stated, the further results now at command indicate pretty nearly the same average composition for the Rugby sewage as that formerly adopted. Thus, whilst calculated according to Dr. Letheby's analyses the Metropolitan sewage contained 6·66 grains of ammonia per gallon, the Rugby sewage was then estimated to contain 6·65 grains, and taking into the calculation all the results now obtained the direct mean of the 93 analyses gives 6·5 grains, and the calculated average about 7 grains.

The amount of ammonia will still, for convenience, be taken as the gauge of comparative value; not, of course, that other constituents are not equally important, but, as already referred to, as the amount of ammonia contributes a very large proportion of the money value as estimated according to composition, and is a pretty sure indication of the approximate value of the associated constituents, it comes to be a very safe index to the approximate value of the whole, and at the same time the discussion is much simplified.

Baron Liebig, adopting as his basis an analysis of Dorset Square sewage by Mr. Way, which showed nearly 18 grains of

ammonia per gallon, estimates the constituents in sewage of that composition to be worth $1\frac{1}{3}d.$ per ton, but that the value will be raised to about $4d.$ if to each ton be added $1\frac{1}{5}$ lb. of superphosphate of lime. But in his report Professor Way stated in reference to the analysis in question, together with another given at the same time, that although the results showed that there was great manurial value in sewage, yet they could not be taken as in any way affording a measure of that value; and he has since given it as his opinion that the sample of sewage, upon the analysis of which Baron Liebig relied, was undoubtedly very much stronger than the average of Metropolitan sewage. Indeed, Baron Liebig himself admitted that more certain data as to the average composition of sewage were wanting. He said, "In the calcu- "lation of the value of sewer water there is one factor doubtful, "viz., the absolute amount of phosphoric acid, ammonia, and "potass, which a ton of the said water contains." Moreover, his proposal to add a certain quantity of superphosphate of lime to the sewage has for its object to assimilate the proportion of phosphoric acid to the ammonia or nitrogen in the sewage to that found in Peruvian guano, which, of course, is a standard having no necessary connexion with the proportions required by soils or crops. For these reasons Baron Liebig's estimates are obviously irrelevant.*

In the Report of Messrs. Hofmann and Witt to the Main Drainage Referees, they record 8·21 grains of ammonia per gallon as the amount they found in a mixture of samples of sewage collected from the Savoy Street sewer every hour during 24 in dry weather; and the Referees had ascertained by gauging that the rate of flow from the sewers under such circumstances averaged as closely as could be expected that which would be due to water supply exclusive of rainfall. In fact, the Referees concluded that the mixed sample in question represented pretty closely the average normal sewage without rainfall of that sewer, and further, that the sewage from that sewer might be taken as fairly representing the Metropolitan sewage under the conditions stated.

With 8·21 grains of ammonia per gallon (and the associated matters), Messrs. Hofmann and Witt estimated the constituents in a ton of such sewage to be worth $2\ \frac{1}{10}\ d.$, and taking (in accordance with the information supplied to them by the Referees) the total amount of the Metropolitan sewage without rainfall at 95 million gallons a day, or about 158 million tons per annum, they estimated the total annual value of the constituents in the Metropolitan sewage to be 1,385,540*l.*

To control this estimate founded on the amount and composition of the sewage, Messrs. Hofmann and Witt calculated the value of the constituents annually voided in the forms of urine

* In a recent letter, published some time after the above was in type, Baron Liebig adopts 7·2 instead of 18 grains, as the average amount of ammonia in a gallon of the Metropolitan Sewage, inclusive of rainfall, &c. It will be seen, by the sequel, that even after this very liberal amendment of his estimate of about a year and a half ago, he is doubtless still too high; and his estimate of value of constituents is so in a corresponding degree.

and fæces by the entire Metropolitan population, assuming it to number 2,600,000 persons. In this way they arrived at a value of 1,444,177*l.*, which they considered satisfactory confirmation of the estimate deduced from the quantity and composition of the sewage. But in their confirmatory estimate they adopt, for the composition and value of the liquid and solid voidings of each individual of a mixed population of both sexes and all ages, the amounts fixed for adult males,* assuming that other matters reaching the sewers would probably make up the difference. There can be little doubt that this was making far too liberal an allowance for the other matters than human voidings, which contribute to the value of the Metropolitan sewage.

The object of the Referees appears to have been to obtain an estimate of the total annual value of the sewage, and with such very great variations as occur in both the amount and composition of the sewage when mixed with different amounts of rainfall, it is obvious that the method they adopted of collecting for analysis samples of sewage as far as possible free from rainfall, and then calculating the composition and value of the estimated total amount of dry weather sewage according to the results of the analysis of such samples, was the only admissible one unless they had taken samples almost the year round. Their estimate of the value per ton of the dry weather sewage, or sewage without rainfall, was, in fact, only a step in the process of calculating the total annual value of the Metropolitan sewage, and they did not give any estimate of the value per ton in the average condition of dilution with rainfall in which it would have to be utilized.

It is variously estimated that the normal sewage, or sewage without rainfall, is on the average the year round mixed with from two thirds to an equal bulk of subsoil water and rain. Assuming it to be so diluted by an addition of two thirds to its own bulk, this, adopting Messrs. Hofmann and Witt's analysis and valuation for the sewage without rainfall, would reduce the average amount of ammonia in the total sewage with rainfall to 4·93 grains per gallon, and it would in like manner reduce the value from $2\frac{1}{10}d.$ for a ton of sewage without rainfall to $1\frac{1}{4}d.$ for a ton inclusive of rainfall.

It is obviously important to consider whether the sample of the Savoy Street sewage analysed by Messrs. Hofmann and Witt was more probably of above or below the average composition and value of the Metropolitan sewage without rainfall? Some judgment may be formed on this point by a careful consideration of the quantity and estimated value of the constituents contributed to the sewage by each individual of a mixed population of both sexes and all ages, taken in connexion with the amount of water through which the constituents are supposed to be on the average distributed.

According to the data of Messrs. Hofmann and Witt the amounts of total solid matter, and ammonia, and the value of

* Messrs. Hofmann and Witt even add something to the actual experimental results obtained with Hessian soldiers to adapt them, as they say, to "John Bull"!

the constituents, in the annual total voidings of an adult male are as follows:—

	Adult males, per head per annum.		
	Total solid matter.	Ammonia.	Value.
	lbs.	lbs.	*s.* *d.*
Urine - -	61	15·8	10 $0\frac{1}{2}$
Fæces - -	34	2·3	1 $8\frac{3}{4}$
Total -	95	18·1	11 $9\frac{1}{4}$

Dr. Thudichum, whose estimate is more recent, and whose experimental data on the point are much more comprehensive than those relied upon by Messrs. Hofmann and Witt, gives for the urine alone of adult males the following:—

	Adult males, per head per annum.		
	Total solid matter.	Ammonia.	Value.
	lbs.	lbs.	*s.* *d.*
Urine alone -	47	15·9	10 $3\frac{1}{2}$

It will be observed that so far as the important items of ammonia and value are concerned, the estimates of Messrs. Hofmann and Witt for the urine of an adult male agree very closely with those of Dr. Thudichum, founded on much more comprehensive analytical data. Dr. Thudichum does not, however, give any estimate of the amount, composition, and value of the fæces. With regard to the urine, he considers that the voidings of 2,800,000 persons of a mixed population of both sexes and all ages, may be taken as equivalent to those of 2,000,000 adult males. If, therefore, we take the mean of the estimates of Dr. Thudichum and Messrs. Hofmann and Witt with regard to the urine, and those of Messrs. Hofmann and Witt with regard to the fæces, of an adult male, and reduce both in the proportion of from 2·8 to 2 according to Dr. Thudichum's basis of calculation, we shall, provided the estimates of the two authorities be correct, arrive at amounts approximately applicable to an average individual of a mixed population of both sexes and all ages. The following results are so obtained:—

	Average of both sexes and all ages, per head per annum.	
	Ammonia.	Value.
	lbs.	*s.* *d.*
Urine - -	11·32	7 3
Fæces - -	1·64	1 $2\frac{3}{4}$
Total -	12·96	8 $5\frac{3}{4}$

Here then, founded upon the estimates of these authorities, we have nearly 13 lbs. of ammonia and nearly 8*s.* 6*d.* of value, to represent the annual mixed voidings of an average individual of a mixed population of both sexes and all ages. In our last Report 10 lbs. of ammonia only (and the value would

be less in a corresponding degree) were taken to represent the mixed excrements of an average individual. This was the estimate of Messrs. Lawes and Gilbert, founded on very comprehensive data, relating both to the amounts of constituents consumed in the food, and voided in the urine and fæces, of persons of different ages and both sexes. But as this estimate was made nearly 10 years ago, since which time much more evidence has been published relating to the amount and composition of human excremental matters, it has been thought desirable to collate, for the purposes of this Report, as far as possible the whole of the information at command up to the present time bearing upon these points.* The result of very much labour expended in this way indicates 12·6 lbs. of ammonia as the amount annually yielded by each average individual, when the calculation is based upon determinations or estimates of the amounts of nitrogen or ammonia-yielding matters voided by persons of different sexes and ages. But when the estimate is founded upon the recorded amounts of fresh urine and fæces voided by individuals of the different classes, and upon the average composition of urine and fæces respectively, the amount of ammonia indicated as the average per head, per annum, is 12·7.

It is admitted, however, by authorities on the subject, that the experimental data relating to males other than in the prime of life, and especially to females of all ages, are as yet inadequate for the basis of really trustworthy average estimates. Indeed, a careful consideration of the circumstances of the majority of the cases contributing to the averages among those divisions of the population in relation to which the evidence is the most plentiful, and of the relative character of the results where it is the most deficient, leads to the conclusion that the estimate of 12·6 lbs. of ammonia per head per annum, arrived at as above described, is in all probability too high.

Then, again, even assuming the approximate correctness of the estimates of Messrs. Hofmann and Witt and Dr. Thudichum of the amount of ammonia yielded by the urine of an average adult male (and those of Dr. Thudichum are based upon a considerable portion of the same data as the estimate of 12·6 given above), it is difficult to suppose that the urine of two such adults should be equalled by so small a proportion as 2·8 persons of a mixed population of both sexes and all ages; and hence we think that the estimate of nearly 13 lbs. of ammonia as deduced from their joint data regarding adult males, and Dr. Thudichum's measure of reduction, also involves elements of error on the side of excess.

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* For nearly the whole, if not the whole, of the data upon which the new estimates are based, *see* "On the Sewage of London," by J. B. Lawes, F.R.S., Journal of the Society of Arts, March 9, 1855; "The Composition of the Urine in Health and Disease," by E. A. Parkes, M.D., 1860; "On an improved Mode of collecting Excrementitious Matter, with a view to its Application to the Benefit of Agriculture, &c.," by J. L. W. Thudichum, M.D., F.C.S., Journal of the Society of Arts, May 15. 1863; and "On the Elimination of Urea and Urinary Water, in relation to the Period of the Day, Season, Exertion, Food, &c. &c.," by Edward Smith, M.D., LL.B., F.R.S., Philosophical Transactions, Vol. CLI., p. 747.

Lastly, the estimate of Messrs. Lawes and Gilbert of the amount of nitrogen in the food of an average individual, which was founded upon the calculation of 86 different dietaries arranged in 15 classes, according to sex, age, activity of mode of life, and other circumstances, showed an amount equivalent to rather less than 12·2 lbs. of ammonia, from which, of course, a deduction has to be made for the nitrogen retained in the body, and for loss in various ways.

Upon the whole, therefore, it is concluded that the amount of ammonia contributed to the sewer-water by each individual of a mixed population of both sexes and all ages, is pretty certainly more than 10 lbs. per annum as formerly assumed, but probably less than 12 lbs.

But it is not the human excretal matters of the resident population that alone contribute to the value of the sewage of the Metropolitan area. To these must be added those contributed by the population daily visiting the Metropolis from beyond its own limits (less the amount from those daily leaving it), the fractional part of the excretal matters of horses, cows, dogs, and other animals, of the refuse from slaughter-houses, of soot, and of the matters derived from the abrasion of the streets, which does not reach the land as stable dung, street sweepings, or in some other form, and also the refuse matters from certain manufacturing processes. It is very difficult to estimate the amount and value of the constituents reaching the sewers from these sources. They are doubtless large in the aggregate; but a little reflection leads to the conclusion that they are very small per head of the population, and that they must bear a very small proportion to those of the human excretal matters of the resident population. Indeed, so far as existing information bears upon the point, it would appear probable that not more than 12½ lbs. of ammonia are contributed annually to the sewers from all sources, per head, of the population. This, including the associated matters, would, according to trade prices, represent a value of 8*s.* 4*d.* per annum for the manurial constituents of the sewage for each average individual of the population.

The question arises—through how much water are these 12½ lbs. of ammonia (with the associated constituents), or, reckoned in value, through how much is this 8*s.* 4*d.* or 100 pence worth of manurial matter on the average distributed?

The dry weather sewage, or sewage without rainfall, of the Metropolis is variously estimated at from 5 to 7 cubic feet per head per day, equal respectively 31$\frac{1}{6}$ and 43½ gallons per head per day, or 50¾ and 71 tons per head per annum. According to the information furnished by the Referees to Messrs. Hofmann and Witt, it averaged about half way between these two extremes, namely, about 36½ gallons per head per day, equal about 59 tons per head per annum. We shall therefore probably be not far wrong if we take 60 tons per head per annum as the average amount of the normal or dry weather sewage. It is further variously estimated that by subsoil water and rainfall the bulk

of the fluid will be increased by from two thirds to an equal volume.* Adopting the lower of these suppositions, which if too low will allow something for the occasional escape of storm-water, we have the 100 pence worth of constituents distributed through 100 tons of fluid, giving to it a value of one penny per ton according to the estimated market value of its manurial constituents.

What the real average dilution of the sewage the year round is, or will be, will doubtless be more certainly ascertained before long, when the main drainage system is completed, and the works have been a sufficient time in operation to render the gaugings safely available for the purposes of average estimates. In the meantime the following Table will be useful, showing the grains of ammonia per gallon, and the estimated value of the constituents per ton of sewage, on the assumption that the amount of ammonia contributed to the sewage from all sources will be at the rate of 12½ lbs. per head per annum of the population, and on the alternative assumptions, that the amount of fluid will be 60, 70, 80, 90, and 100 tons per head per annum. For comparison with these estimates there are given those of Messrs. Hofmann and Witt, according to their direct analysis of the dry weather sewage, and also the calculated amounts according to their analysis, supposing a dilution of 100 tons per head per annum with subsoil water and rainfall, instead of 60 tons without them, which their mixed sample of the Savoy Street sewer was supposed to represent.

TABLE XI.—Grains of Ammonia per Gallon, and estimated Value of the constituents in one ton, of Sewage at different dilutions, supposing 12½ lbs. of ammonia per head per annum, from all sources.

	Ammonia per Gallon.	Estimated Value per Ton.
	Grains.	*d.*
If 60 tons of fluid per head per annum	6·51	1·67
70 „ „ „	5·58	1·43
80 „ „ „	4·88	1·25
90 „ „ „	4·34	1·11
100 „ „ „	3·91	1·00
Hofmann and Witt—mixed sample of dry weather sewage from Savoy Street sewer	8·21	2·11
The same if diluted with two-thirds its volume of subsoil water and rain-fall	4·93	1·27

Thus, assuming the amount of ammonia contributed to the sewage from all sources to be 12½ lbs. per head of the population, per annum, the dry weather sewage reckoned at 60 tons per head per annum would contain 6½ grains of ammonia per gallon; and, according to the currently adopted modes of computation, taking dry and portable manures as the standard, the total manurial

* Mr. Bazalgette informs us that the quantities of subsoil water and rainfall are too variable and irregular to enable him to give us any average.

constituents in one ton of such sewage will be worth $1\frac{2}{3}$ penny. Or, reckoning the average sewage, including subsoil water and rainfall, at 100 tons per head per annum, it will contain scarcely 4 grains of ammonia per gallon, and the manurial constituents in one ton of it will be worth just one penny.

If the above estimates for the dry weather sewage be correct, it is obvious that the sample analysed by Messrs. Hofmann and Witt was about one fourth stronger than the average Metropolitan sewage without rainfall. Their sample was, indeed, collected in a manner which gives it a better claim to the character of an average sample than any other of which the circumstances of collection, and the composition as determined by analysis, have hitherto been recorded. Still, it cannot be surprising to find that their results are probably in error to the extent above stated, when it is borne in mind that their sample was taken during 24 hours only, from one sewer only, and from one contributed to by a much more dense population than the average of equal areas in the Metropolitan district.

The approximate correctness of the above estimates of the average composition of the Metropolitan sewage, founded upon a consideration of the amount of manurial matters contributing to it and the amount of water through which they are distributed, is confirmed in a very striking and satisfactory manner by the fact, that the average amount of ammonia in the Rugby sewage, as deduced from the results of the direct analysis of 93 samples, representing the flow of 31 months, is almost exactly that arrived at by calculation, based upon a knowledge of the amount of population, and the average amount of water contributing to the sewage, and upon the assumption that $12\frac{1}{2}$ lbs. of ammonia will be contributed to it per head per annum. Thus, based upon the actual water supply over the three years 1859, 1860 and 1861, and upon the average rainfall over the seven years from 1855–1861 inclusive, it is estimated that there is at Rugby an average of about 60 tons of sewage per head per annum; and as Table XI. shows, if $12\frac{1}{2}$ lbs. of ammonia be distributed through that amount of fluid it will contain $6\frac{1}{2}$ grains of ammonia per gallon, and will have a value, calculated according to the trade prices of its manurial constituents, of $1\frac{2}{3}$ penny per ton. But the 31 months, to the sewage of which the analyses refer, were drier than usual, and hence the average amount of ammonia per gallon amounted to 7 grains, which, still reckoning $12\frac{1}{2}$ lbs. of ammonia per head per annum, is equivalent to only $55\frac{3}{4}$ tons of fluid per head per annum, which is probably more nearly the amount than 60 tons for the comparatively dry period.

Assuming the sewage of Rugby to amount to 60 tons, and that of the Metropolis to 100 tons per head per annum, including subsoil water and rainfall, it results that the latter will have less than two thirds the strength and value of the former. In fact, whilst 1,000 tons of the average sewage of Rugby would represent between 16 and 17 individuals of a mixed population of both sexes and all ages, the same quantity of that of

the Metropolis would represent only about 10 such individuals; and whilst, reckoned according to the amount of constituents they respectively contain, a ton of the average Rugby sewage would be worth $1\frac{2}{3}$ penny, a ton of the Metropolitan sewage would be worth only 1 penny.

It may safely be affirmed that there is, as yet, no record of the analysis of any sample of sewage the circumstances of the collection of which justify the assumption that it fairly represents the average Metropolitan sewage, either with or without subsoil water and rainfall. Compared with any analytical results hitherto published, there can be little doubt that those arrived at by the synthetic method above described are much more trustworthy. It is to be hoped, however, that when the main drainage system comes to be in full operation, competent persons will be appointed to superintend the gauging, sampling, and analysis, with a view to providing data which may serve to determine satisfactorily the approximate average composition of the Metropolitan sewage as it will have to be dealt with in any plan of utilization.

For the convenience of those interested in estimates of the composition and value of town sewage, it may be mentioned that if a value of 8*d.* be put upon every lb. of ammonia, or if for each grain of ammonia per gallon a value of one farthing per ton be given to the sewage, the result will in either case agree almost exactly with that obtained by the elaborate method of giving the currently adopted market values to the several constituents, taking dry and portable manures as the standard.

The subject of the value realized, or realizable, by the agricultural utilisation of sewage in various ways is, of course, quite distinct from that of the estimated money value, according to the trade prices of the constituents, and is considered in other Sections of the Report.

VII. *Composition of the Drainage Water* (*Rugby*).

It is obvious that in attempting to determine experimentally the effects of applying to the land given amounts of sewage of known composition, there are other data essential to a right judgment of the results than those provided in the records of the increased amounts of produce yielded. It is necessary to consider,—

1. To what extent the sewage is deprived of its manurial or putrescible constituents in its passage over and through the land?

2. Whether the sewaged land is left in a higher or a lower condition after the removal of the crop?

To gain some information in reference to the second of these points it was decided that during the season of 1864 the produce of each plot should be carefully weighed, sampled, and analysed, without any further application of sewage, and that the soil of each plot should be submitted to such chemical examination as time and other circumstances would permit. The results of this part

of the inquiry are recorded in Section XII., p. 62, et seq. It may, however, be here observed, in passing, that barley (unmanured) was grown upon the three plots devoted to the experiments on the application of sewage to rye-grass in 1863, and that the crop, during growth, was obviously heavier where sewage had been applied than where it had not, and heavier also where the larger than where the smaller quantity was employed.

In order to determine how far the sewage-water was deprived of its manurial, or putrescible, constituents in its passage over and through the land, samples of the drainage water were collected simultaneously with those of the sewage in each field (commencing May 1862 and ending October 1863), and sent to Professor Way for analysis. In all 62 analyses of drainage water (or rather partial analyses corresponding in detail with those of the sewage) have thus been made. A few other special analyses, in much more detail, have been made of the sewage and drainage of the season of 1864.

The detailed results of the 62 analyses above referred to will be found in Tables XXII.–XXVII., pp. 170–175, in the Appendix. The following Table XV. gives a summary of the results, showing, in parallel columns, the average composition of the sewage and the drainage water, the first division referring to the samples collected during the months of May to October inclusive, 1862, and the second to those obtained from November 1862 to October 1863, both inclusive.

TABLE XV.—Average Composition of the Sewage and Drainage Water collected at Rugby in the Seasons of 1862 and 1863.

Grains per Gallon.

	Five-acre Field.		Ten-acre Field.		The Two Fields.	
	Sewage water.	Drainage water.	Sewage water.	Drainage water.	Sewage water.	Drainage water.
Season 1862.—May to October, both inclusive.						
Substances in Solution — Organic	7·83	7·18	7·60	7·83	7·71	7·56
Substances in Solution — Inorganic	34·49	34·50	32·38	37·10	33·44	36·01
Substances in Solution — Total	42·32	41·68	39·98	44·93	41·15	43·57
Substances in Suspension — Organic	14·69	1·40	17·14	1·39	15·92	1·39
Substances in Suspension — Inorganic	25·67	1·81	24·89	3·74	25·28	2·92
Substances in Suspension — Total	40·36	3·21	42·03	5·13	41·20	4·31
Total organic matter	22·52	8·58	24·74	9·22	23·63	8·95
Total inorganic matter	60·16	36·31	57·27	40·84	58·72	38·93
Total solid matter	82·68	44·89	82·01	50·06	82·35	47·88
Ammonia — In solution	4·13	0·80	4·26	1·85	4·20	1·41
Ammonia — In suspension	1·37	0·24	1·52	0·33	1·44	0·29
Ammonia — Total	5·50	1·04	5·78	2·18	5·64	1·70

		Five-acre Field.		Ten-acre Field.		The Two Fields.	
		Sewage water.	Drainage water.	Sewage water.	Drainage water.	Sewage water.	Drainage water.
Season 1863.—November 1862 to October 1863, both inclusive.							
Substances in solution	Organic	8·35	7·46	8·30	7·98	8·32	7·73
	Inorganic	39·57	38·55	38·77	41·35	39·18	39·98
	Total	47·92	46·01	47·07	49·33	47·50	47·71
Substances in suspension	Organic	27·35	1·41	25·99	3·29	26·69	2·37
	Inorganic	39·41	2·14	34·93	3·93	37·22	3·06
	Total	66·76	3·55	60·92	7·22	63·91	5·43
Total organic matter		35·70	8·87	34·29	11·27	35·01	10·10
Total inorganic matter		78·98	40·69	73·70	45·28	76·40	43·04
Total solid matter		114·68	49·56	107·99	56·55	111·41	53·14
Ammonia	In solution	5·83	0·69	5·69	1·85	5·76	1·28
	In suspension	2·08	0·15	1·98	0·31	2·03	0·23
	Total	7·91	0·84	7·67	2·16	7·79	1·51

It is seen that of the matter in suspension nearly the whole, both organic and inorganic, has been separated from the sewage in its passage over and through the land; the drainage water containing but little of either, and probably a considerable part of that which it did contain was not contributed by the sewage, but was derived from the soil itself.

Of matter in solution, on the other hand, a gallon of drainage water contained sometimes more and sometimes less, but on the average much about the same amount both organic and inorganic as a gallon of the sewage. Here, again, there can be little doubt that a considerable portion of the matters found in the drainage water had their source in the soil itself—that there had, in fact, been an interchange; the sewage giving up to the soil valuable manurial constituents, and the fluid in its turn taking up substances from the soil for which the latter had less power of retention.

The character of the interchange of matters in solution as the sewage passed through the soil will be better understood on an inspection of Table XVI. (overleaf); but before referring to its details attention should be directed to one or two other points brought to light in Table XV.

As might be expected there was a larger portion of almost every constituent, or class of the constituents, enumerated, in the drainage from the high ridged and steeply sloping 10-acre field, over and through which the fluid passed the more rapidly, than in that from the almost level 5-acre field. This result is not only the most remarkable in degree, but the most important to remark, in the case of the ammonia. Thus, whilst a gallon of the drainage water from the 5-acre field contained, in 1862 only from one fifth to one sixth, and in 1863 little more than one tenth as much ammonia

as a gallon of the sewage, a gallon of the drainage from the 10-acre field contained, in 1862 more than one third, and in 1863 more than one fourth as much as an equal volume of the sewage. It is obvious, therefore, that the retention by the soil of the valuable manurial matters of the sewage was much less perfect in the case of the high ridged and steeply sloping 10-acre than in that of the flatter 5-acre field.

As above referred to, Table XVI., which now follows, shows more in detail the changes in the composition of the fluid in its passage through the soil.

TABLE XVI.—Detailed Composition of Samples of Sewage and Drainage Water collected at Rugby in the Summer of 1864.

	Constituents.	Grains per Gallon.			
		Collected July 6–11.		Collected July 13–18.	
		Sewage.	Drainage.	Sewage.	Drainage.
In solution	Inorganic matter:—				
	Oxide of Iron, &c.	Traces.	—	1·25	0·25
	Lime	8·45	10·25	8·23	10·08
	Magnesia	1·76	1·69	1·80	1·69
	Soda (1)	5·46	0·38	5·24	2·30
	Chloride of Sodium (1)	6·82	9·73	8·53	9·21
	Chloride of Potassium (1)	6·08	1·50	6·17	2·34
	Sulphuric acid	4·39	6·55	4·01	6·75
	Phosphoric acid	1·23	0·44	1·66	0·32
	Carbonic acid	8·83	6·18	7·42	7·01
	Silica	1·80	0·80	1·00	0·80
	Total	44·87	37·52	45·31	40·75
	Organic matter	11·20	7·80	10·00	7·05
	Total matter in solution	56·07	45·32	55·31	47·80
In suspension	Inorganic matter:—				
	Oxide of Iron and Alumina	4·57	..	6·30	..
	Lime	4·43	..	3·75	..
	Magnesia	0·65	..	0·25	..
	Carbonic acid	3·25	..	2·17	..
	Phosphoric acid	1·84	..	1·14	..
	Silica, sand, &c.	31·60	..	39·30	..
	Total	46·39	..	52·91	..
	Organic matter	40·40	..	32·40	..
	Total matter in suspension	86·79	..	85·31	..
	Total inorganic matter	91·26	37·52	98·22	40·75
	Total organic matter (2)	51·60	7·80	42·40	7·05
	Total solid matter	142·86	45·32	140·62	47·80
(1) Containing	Potass	3·84	0·94	3·90	1·48
	Soda	2·07	5·54	2·76	7·17
	Chlorine	7·03	6·61	8·10	6·70
(2) Containing	Ammonia: In solution	5·74	0·98	6·36	0·92
	Ammonia: In suspension	2·92	..	2·42	..
	Ammonia: Total	8·66	0·98	8·78	0·92
	Nitric acid in solution = Ammonia	..	(3) 1·33	..	(4) 1·41

(3) 4·227 Nitric acid = 1·096 Nitrogen = 1·331 Ammonia.
(4) 4·483 „ „ = 1·162 „ = 1·411 „

The samples of sewage and drainage to which Table XVI. refers were not collected in either of the fields formerly under experiment, but in a meadow in the occupation of Mr. Campbell, where sewage had been pretty liberally applied for the last two or three seasons, but in which the application had been suspended for some weeks until within a few days of commencing to take the samples. The plan of collection, both for sewage and drainage, was, to take of the former about a gallon, and of the latter about half a gallon, 8 or 10 times during the 10 or 12 working hours of the day; at the end of the day after well shaking to take a gallon from each mixture, and to repeat this for six consecutive days until six gallons of each was obtained; when, from each, after well shaking, a two gallon sample was taken, and sent to Professor Way for analysis. The sewage flowed from the main into open runs for distribution over the land, but for the purpose of collecting the samples, the stand pipe was each time affixed, and the water allowed to flow through it for ten minutes before the sample was taken. The drainage was taken direct from the main cross pipe drain at the lower end of the field. Both sewage and drainage were allowed to run an hour or two each morning before taking the first sample.

During, and for sometime previous to, the collection of these samples, the weather was unusally dry, and the land was itself so dry, and in many places cracked, that it was feared a good deal of the sewage would find its way too directly to the drains. Judging from the results, however, which shew a less amount of matter in solution (both organic and inorganic) in a gallon of drainage in proportion to that in an equal volume of sewage than in the average of the cases relating to the other fields and previous seasons, it would appear that the soil had done its work of absorption at any rate as well in the cases to which the more detailed analysis refer as in the majority of the others. It would, obviously, be desirable to have samples taken for analysis under very different conditions of the weather and of the land; and the plan was, to have such samples taken and analysed; but up to the time of writing the drought has continued, and it is doubtful whether results relating to wetter weather can be available for embodiment in the present report.

In judging of the results of either Table XV. or XVI., it will of course be borne in mind, that the quantity of any constituent in a gallon of the drainage water compared with that in a gallon of the sewage, by no means directly indicates the proportion supplied by the latter which has not been taken up by the soil. We had not the means of gauging the amount of fluid passing off as drainage water; but excepting when the land is already saturated, it must obviously be considerably less than that passed on to it as sewage. In fact, a gallon of drainage water will represent much more than a gallon of sewage, and hence the amount of any consituent of the sewage found in a gallon of the drainage must have been derived from more than a gallon of the former. The non-retention of valuable manurial matters by the soil was, therefore,

not so great as would at first sight appear from an inspection of the comparative composition of equal volumes of sewage and of drainage water.

It is satisfactory to observe that, of the inorganic matters in solution in the sewage, by far the larger proportion of those constituents which, by the removal of the produce from the land, are the most likely to become deficient relatively to others, is retained by the soil. Thus, smaller proportions of both the potass and the phosphoric acid coming on to the land in the sewage passed off in the drainage than of any other constituents. Of the bases, soda was also retained by the soil to a considerable extent, magnesia in a less degree, and lime less still. Indeed, of lime, there was more in a gallon of drainage than in a gallon of sewage. Of sulphuric acid, again, there was considerably more in the drainage than in an equal volume of the sewage. Lastly, of soluble silica a considerable portion passed off in the drainage.

Of inorganic matter in suspension, the quantity in the drainage water was so small, and it was so obviously derived from the soil, that it was considered quite unnecessary to submit it to analysis. It may be concluded, indeed, that practically the whole of the suspended matter of the sewage, both inorganic and organic, would be retained by the soil. It will be observed that a considerable proportion of the phosphoric acid of the sewage was in the suspended matter; and as there was none in that of the drainage, a much larger proportion of the total amount of that constituent of the sewage was retained by the soil than appears from the figures relating to the phosphoric acid in solution alone.

Of organic matter in solution a very considerable quantity was found in the drainage water; though, compared with the amount in the sewage, not quite so much in the two cases to which Table XVI. refers as on the average of the large number of cases to which Table XV. relates. There can be little doubt, however, that the soluble organic matter of the drainage was very different in character to that in the sewage. That set down as soluble organic matter in the sewage contained a very much larger proportion of nitrogen as ammonia, or ammonia-yielding matter, than that in the drainage. It is probable too, that, during periods of active vegetation, a notable portion of the soluble organic matter of drainage will frequently be derived from vegetable matter within the soil, and not directly from the sewage.

An important point to remark, which the more detailed analyses recorded in Table XVI. discloses, is, that whilst the sewage did not contain an appreciable amount of nitric acid, the drainage contained more nitrogen in that form than as ammonia; and adding the amount of ammonia to which the nitrogen in the nitric acid is equivalent to that determined as such, it would appear that the soil had not retained so large a proportion of that important manurial constituent of the sewage as might have been judged if only the more partial analyses, the average results of which are recorded in Table XV., had been made.

The amounts of potass, phosphoric acid, ammonia, and nitric acid, found in the drainage water, clearly show that the sewage was not perfectly deprived of its valuable manurial matters in its passage through the soil; and the amounts of total soluble matter, and especially of soluble organic matter, show that it was by no means perfectly purified. There is, indeed, a limit, depending upon the physical and chemical characters of the soil, and upon the amount and composition of the fluid passed through it, to the power which a soil possesses of removing substances from solution, or of preventing those already absorbed from being dissolved, in water passing through it; and so far as the soluble organic matters of the drainage are derived from vegetable matter within the soil, it is a question whether there will not always be a considerable amount in that passing from land covered with a luxuriant vegetation. So far, however, as the nitrogen of the drainage exists in the form of nitric acid, it is a pretty satisfactory indication that the organic matter has to a great extent already passed the stage of deleterious putrescence.

In the experiments under consideration the arrangements were not such as to allow of the water drained from one portion of the land being passed over another, otherwise it would no doubt have been more completely both utilized and purified. At Beddington, near Croydon, where a tract of about 250 acres is already laid down for sewage irrigation by gravitation and open runs (and the area is in course of enlargement), a great portion of the water does duty twice, and sometimes three times; and from the results of some analyses of the sewage and of the drainage water, which have kindly been communicated by Mr. Latham, the Engineer to the Croydon Local Board of Health, it appears (see Appendix, No. 3, p. 203.) that the water eventually passes from the land in a state of much greater purity than was the case in the Rugby experiments. In fact, before the present arrangements were in force, the Croydon Board had to meet numerous law suits on account of the pollution of the river by the sewage; but so efficiently is the sewage now purified that those having the right of fishing in the river have found it worth while to fix gratings to prevent the fish going up the main outfall from the sewage irrigated land.

It is clear that in any extensive scheme for the irrigation of grass land by sewage, the arrangements should be such as to allow of the water being passed over or through the land more than once, so that both the utilisation and the purification may be as complete as possible.

VIII. *Composition of the Unsewaged and Sewaged Grass.*

It has been seen that, reckoned in the fresh or green state, a greater weight of sewaged than unsewaged grass, was required to yield a given amount of milk or increase in live

weight; but that less of the dry or solid substance of the sewaged than of the unsewaged grass was required to produce a given amount of milk or increase. It was further found that, especially in the case of the sewaged grass, it required less, both of green grass and of dry substance of grass, to yield a given return in milk during the earlier than the later portions of the season, and also less in one season than in another. It is obviously important, therefore, to ascertain the difference in the proportion of dry or solid substance, and the difference in the composition of the solid substance itself, of the grass grown without and with sewage, with smaller and with larger quantities of sewage, at different periods of the season, and in different seasons.

The mode of taking and preparing samples for analysis was sufficiently described in our former Report; and the general results of the analyses of the produce of the first season (1861) were also there discussed; the details being given in Tables XXXIX., XLV., in the Appendix to that Report.

The detailed results of the analysis of the produce of 1862 and 1863 are given in Tables XXVIII.–XL., pp. 176–193, in Appendix No. 1. to the present Report; but the following summary Tables XVII. and XVIII. bring together, side by side, the mean results, both as to proportion of dry substance and composition of dry substance, for each of the three seasons over which the experiments have been conducted, and these will be sufficient to indicate the chief points of interest.

The general indications of the further results now adduced are strictly accordant with those formerly reported; the only new point illustrated being the difference in the composition of the grass in one season compared with another.

Comparing first the composition of the grass produced under different conditions, in one and the same season, it is seen that there is in each season a very great difference, both in the proportion of the dry substance and in the composition of that dry substance, according to the varying circumstances of growth. With scarcely an exception in either season, the proportion of dry or solid substance in the grass as cut, weighed, and given to the animals, was considerably lower in the sewaged than in the unsewaged grass, and generally the lower the larger the quantity of sewage employed. There was also, pretty uniformly, a diminished proportion of dry substance in each successive cutting as the season advanced.

It will be readily understood that the proportion of dry or solid substance in the grass depends upon the stage of growth, the proportion of leaf and stem, and the condition of the weather at the time of cutting. The grass grown without sewage was for the most part cut at a later stage of growth, and showed more tendency to form stem and seed than that grown with it, and the greater the quantity of sewage the greater was the production

TABLE XVII.—Per-centages of Dry Substance in the Unsewaged and the Sewaged Grass.

SEASONS 1861, 1862, and 1863.

	Five-acre Field.					Ten-acre Field.				
	Unsewaged, Plot 1.	Sewaged. Plot 2.	Plot 3.	Plot 4.	Mean.	Unsewaged, Plot 1.	Sewaged. Plot 2.	Plot 3.	Plot 4.	Mean.
Meadow Grass. First Season, 1861.										
1st Crop -	27·9	30·5	26·9	27·7	28·3	22·0	23·3	21·4	18·4	21·3
2d Crop -	24·4	19·8	14·2	13·3	17·9	26·9	17·1	15·1	16·1	18·8
3d Crop -	..	13·4	13·7	12·9	13·3	..	12·6	7·3	14·4	11·4
4th Crop -	..	..	15·4	9·6	12·5	..	16·9	15·1	17·8	16·6
Mean -	26·2	21·2	17·6	15·9	..	24·5	17·5	14·7	16·7	..
Meadow Grass. Second Season, 1862.										
1st Crop -	26·7	22·8	14·4	15·3	19·8	26·9	19·5	13·5	13·1	18·3
2d Crop -	22·8	14·3	16·4	19·4	18·2	17·9	16·2	19·0	16·7	17·5
3d Crop -	..	18·2	12·9	14·2	15·1	..	14·5	14·4	15·8	14·9
4th Crop -	..	..	..	..	..	..	..	..	*33·8	33·8
Mean -	24·8	18·4	14·6	16·3	..	22·4	16·4	15·6	15·2	..
Meadow Grass. Third Season, 1863.										
1st Crop -	36·1	21·5	17·6	16·3	22·9	39·8	18·6	20·0	14·6	23·3
2d Crop -	34·4	18·5	14·9	17·8	21·4	18·2	17·7	16·3	18·8	17·8
3d Crop -	..	17·7	10·9	17·6	15·4	..	12·4	14·6	15·2	14·1
4th Crop -	..	15·8	13·0	12·3	13·7	..	..	13·9	13·6	13·8
5th Crop -	..	..	..	15·3	15·3	..	..	..	..	..
Mean -	35·3	18·4	14·1	15·9	..	29·0	16·2	16·2	15·6	..

Italian Rye Grass, 1863.

	Unsewaged, Plot 1.	Sewaged. Plot 2.	Plot 3.	Mean.
1st Crop - -	21·3*			21·3
2d Crop - -	23·7	18·8	17·5	20·0
3d Crop - -	36·4	27·5	18·3	27·4
4th Crop - -	33·2	13·8	18·9	22·0
5th Crop - -	19·9	16·8	17·8	18·2
6th Crop - -	..	18·6	20·4	19·5
	28·3	19·1	18·6	..

* All three plots were unsewaged until after the first cutting.

TABLE XVIII.—Mean Composition (per cent.) of the Dry Substance of the Grass, without and with Sewage, and in each successive Crop.

In Seasons 1861, 1862, and 1863.

	Without and with Sewage.				Each successive Crop.					
	Unsewaged,	Sewaged.			1st Crop.	2d Crop.	3d Crop.	4th Crop.	5th Crop.	6th Crop.
	Plot 1.	Plot 2.	Plot 3.	Plot 4.						
Meadow Grass—First Season, 1861.										
Number of analyses giving the means	5	7	9	9	11	9	7	5		
Nitrogenous substance (N × 6·3)	13·08	18·67	18·92	19·78	10·33	18·07	23·76	28·25		
Fatty matter (ether extract)	3·21	3·54	3·53	3·44	3·01	3·60	3·65	3·84		
Woody fibre	28·80	29·34	30·15	29·15	30·80	28·45	28·50	28·60		
Other non-nitrogenous substances	45·66	37·09	35·94	35·92	47·79	38·28	30·84	24·57		
Mineral matter (ash)	9·25	11·36	11·46	11·73	8·07	11·60	13·25	14·74		
	100·00	100·00	100·00	100·00	100·00	100·00	100·00	100·00		
Meadow Grass—Second Season, 1862.										
Number of analyses giving the means	4	6	6	7	11	9	6	1		
Nitrogenous substance (N × 6·3)	9·49	15·65	15·70	16·83	11·65	12·70	20·44	18·22		
Fatty matter (ether extract)	2·93	3·81	3·64	3·85	2·82	3·72	4·34	4·42		
Woody fibre	29·80	29·20	29·18	29·86	32·42	29·01	26·69	24·86		
Other non-nitrogenous substances	47·84	40·70	40·50	39·01	44·40	43·87	36·00	38·70		
Mineral matter (ash)	9·94	10·64	10·98	10·45	8·71	10·70	12·53	13·80		
	100·00	100·00	100·00	100·00	100·00	100·00	100·00	100·00		
Meadow Grass—Third Season, 1863.										
Number of analyses giving the means	4	7	8	9	8	8	6	5	1	
Nitrogenous substance (N × 6·3)	10·31	18·43	20·49	22·38	15·05	16·64	19·88	26·12	32·19	
Fatty matter (ether extract)	4·08	5·04	4·68	4·83	4·79	4·31	5·00	4·93	5·07	
Woody fibre	28·64	26·08	25·62	25·40	26·55	28·07	26·08	23·33	20·51	
Other non-nitrogenous substances	47·29	39·48	37·82	35·79	44·32	39·68	37·05	33·26	29·62	
Mineral matter (ash)	9·68	10·97	11·39	11·60	9·29	11·30	11·99	12·36	12·61	
	100·00	100·00	100·00	100·00	100·00	100·00	100·00	100·00	100·00	
Italian Rye-grass, 1863.										
Number of analyses giving the means	5	5	5		1	3	3	3	3	2
Nitrogenous substance (N × 6·3)	12·44	18·78	18·11		12·51	12·86	11·07	16·70	20·91	24·76
Fatty matter (ether extract)	3·53	4·45	3·85		3·61	3·01	3·28	4·31	4·49	5·13
Woody fibre	24·68	25·51	25·55		17·79	26·95	28·79	27·16	22·64	22·16
Other non-nitrogenous substances	49·21	39·76	41·47		56·59	48·28	48·88	40·87	38·34	33·24
Mineral matter (ash)	10·14	11·50	11·02		9·50	8·90	7·98	10·96	13·62	14·71
	100·00	100·00	100·00		100·00	100·00	100·00	100·00	100·00	100·00

of succulent leaf; though, even with sewage, the tendency to run to seed is much greater in hot and dry than in cold and wet seasons. Then again, the earlier crops of the season are not only grown under much more favourable maturing conditions, but, from their much greater abundance, they are generally cleared more slowly, and are therefore liable to be in a more advanced stage when cut; whilst the later ones are not only produced under less favourable maturing circumstances, but are frequently much more affected in their condition by unfavourable weather at the time of cutting.

With Italian rye grass, as well as with meadow grass, the herbage in the condition in which it was cut was found to be much more succulent when grown with sewage than without it. In the case of the rye grass, however (though it is true only small quantities of sewage were applied, and the results relate to only one season), the diminution in the proportion of dry substance as the season advanced was somewhat less marked.

The general result is, that there was a less proportion of dry or solid substance in the sewaged grass, as cut, than in the unsewaged; but that a given amount of dry substance in the sewaged was more productive of milk and increase than an equal amount in the unsewaged grass.

The question arises,—was there any difference in the composition of the dry or solid substance of the unsewaged and the sewaged grass which may account for the higher food-qualities of that of the sewaged?

Table XVIII. shows that the most remarkable difference was in the proportion of the nitrogenous constituents, the per-centage of which was in each season much higher in the solid matter of the sewaged than in that of the unsewaged grass, and also the higher the greater the quantity of sewage applied. The proportion of green and impure fatty or waxy matter was also somewhat, but in a less degree than the nitrogenous substance, the greater in the sewaged grass. The comparatively indigestible woody fibre, judging from the results of 1862 and 1863, when the sewaged crops were cut in a younger and more favourable condition than in 1861, will probably average less in sewaged than in unsewaged grass. But the mineral matter, like the nitrogenous and green fatty or waxy matters, is in the larger amount in the sewaged grass, and like them also, a relatively large amount of it is generally indicative of a more unripe and succulent condition.

That the higher milk-yielding qualities of the solid matter of the sewaged grass do not depend simply on its higher per-centage of nitrogenous constituents is evident from the fact that the solid matter of the later crops of the season, which, weight for weight, had much less value as food than that of the earlier, nevertheless contained a very much higher proportion of nitrogenous substance. Indeed, there was generally more than twice as much nitrogenous

substance in a given amount of the solid matter of the last than of the first crop of the season.

It would appear that the higher qualities of the solid matter of the sewaged grass, and of the grass grown in the earlier and more genial periods of the season, were due rather to a favourable condition of maturation, and, therefore, of digestibility and assimilability, of the constituents. That the condition of maturation or elaboration of the constituents had much to do with the quality of the grass is evident from the fact that the produce of the warmer seasons of 1861 and 1863 was much more productive than that of the cold and wet season of 1862. And that a comparatively high per-centage of nitrogenous substance is only advantageous when accompanied with a favourable condition of maturation, may be gathered from the fact that with the higher per-centage of nitrogen in the produce grown in the more favourable seasons of 1861 and 1863 there was higher feeding quality, whilst with the higher per-centage of nitrogen in the produce grown in the later and colder periods of the seasons, there was lower feeding quality.

Italian rye grass seems to be subject to very similar variations in composition, by the application of sewage, and at different periods of the season, as meadow grass; but as the amounts of sewage applied to it were comparatively small, and the results relate to one season only, it can scarcely be judged with certainty, whether or not the changes in composition would, under comparable circumstances, be much the same in degree as well as kind, with the two descriptions of herbage. The feeding results seem to indicate that the Italian rye grass deteriorated somewhat less than the meadow grass as the season advanced, but the difference in chemical composition offers no very obvious explanation of the fact.

IX. *Effects of Sewage on the mixed herbage of grass land in developing the more freely growing, at the expense of the less freely growing plants.*

It is well known that active manures of any kind, when applied to the mixed herbage of grass land, develop certain more freely-growing plants to the partial, or in some cases, the entire exclusion of others. Irrigation, whether by sewage or otherwise, produces very similar effects.

On careful inquiry, and by the aid of samples obtained from some of the most important sewage meadows in the neighbourhood of Edinburgh, it is found that wherever the application has been continued for a considerable number of years, the produce consists almost exclusively of rough meadow grass (*poa trivialis*), common couch grass (*triticum repens*), and in a smaller proportion of rye grass (*lolium perenne*), or rough cock's-foot (*dactylis glomerata*), or both; the chief weed being crow-foot (*ranunculus*), of various

species. In four out of five reports from as many different sewage farmers, the poa is said to stand first, and the couch grass second in degree of prominence. The poa also seems to stand first in estimation as a sewage grass; whilst the common couch is also much valued. Indeed, Mr. Thomson, of Roseburn, informs us that he has actually transplanted this weed of our corn fields from his arable land to lay down for sewage meadow, and that the result has been quite satisfactory; he also informs us that when he has sown as many as 15 or 20 different kinds, most of them have gradually died out, and after some years only a few suitable to the land and the treatment remained. (See notes on the Edinburgh Meadows, Appendix, p. 198 et seq.)

At Rugby similar effects, but at present in a less degree, have been produced. The following observations on the character of the herbage in the two fields are founded upon the records of a careful examination made in August 1862, since which time, however, further change has doubtless taken place on the sewaged plots.

The portion of land left unsewaged by the Commission in the five-acre field had received less sewage previously than that in the ten-acre field, and showed somewhat greater complexity of herbage.

In the five-acre field the most prominent grasses on the unsewaged portion were woolly soft-grass (*holcus lanatus*), common bent grass (*agrostis vulgaris*), rough meadow grass (*poa trivialis*), hard fescue (*festuca duriuscula*), rough cock's-foot (*dactylis glomerata*), and rye grass (*lolium perenne*), with a number of others in much smaller proportion. The herbage also comprised several species of the Leguminous family, besides a number of weeds, of which the most prominent were ribwort (*plantago lanceolata*), milfoil (*achillæa millefolium*), sorrel dock (*rumex acetosa*), and dandelion (*taraxacum dens-leonis*). In the ten-acre, as in the five-acre field, the cock's-foot, woolly soft grass, rye grass, and hard fescue, were among the most prominent of the grasses without sewage, whilst the rough meadow grass, and others, were less prominent than in the five-acre field. The amount of Leguminous herbage was also less than in the five-acre field, whilst crow-foot was extremely abundant.

In the sewaged herbage of both fields the cock's-foot and woolly soft grass were by far the most abundant, the rye grass coming next, and perhaps the rough meadow grass or the hard fescue next, others being more reduced. In both fields the Leguminous herbage was much reduced in proportion under the influence of sewage, whilst in the five-acre field the sorrel-dock, and in the ten-acre the crow-foot, were the most prominent weeds.

In the sewage meadows near Croydon, the cock's-foot and rye grass appear to be the predominating grasses.

The general effect of sewage irrigation on the mixed herbage of meadow land may be stated to be, to develop the Graminaceous

herbage chiefly, nearly to exclude the Leguminous, and to reduce the prevalence of miscellaneous or weedy plants, but much to encourage individual species. It also, at the expense of the rest, encourages a few free-growing grasses, among which, according to locality and other circumstances, the rough meadow grass, couch grass, rough cock's-foot, woolly soft grass, and rye grass, have been observed to be very prominent. The result is an almost exclusively Graminaceous, and very simple herbage. But, as the produce of sewage irrigated meadows is generally either cut or grazed in a very young and succulent condition, the tendency which the great luxuriance of a few very free growing grasses has to give a coarse and stemmy later growth is not an objection, as it is in the case of meadows left for hay. Indeed, as has been already shown, when the produce is given to animals in a green and succulent state, a given weight of the dry or solid substance of the more simple sewaged grass is more productive than an equal weight of that of the more complex unsewaged produce.

X. *Composition of the milk yielded from the unsewaged and from the sewaged grass.*

Once a week during the greater part of the season of 1861, the morning and evening milk of the cows fed on unsewaged grass was mixed together, and a gallon sample taken. Samples of the milk from the sewaged grass were taken in the same way. In 1862 similar samples were collected, but then only once a month. In 1863 none were taken. In all cases the samples were, as soon as taken, put into bottles filled up to the corks, sealed down, and sent off the same evening by railway to Professor Way for analysis.

In 1861 there were in all 13 samples of milk from unsewaged, and 15 from the sewaged grass, and in 1862, six from the unsewaged and six from the sewaged grass so collected and submitted to analysis. The results of each of the 28 analyses of the milk of 1861 were given in Table XLVI. in the Appendix to the previous Report, and those of the 12 made of the milk of 1862 are given in Table XLI., p. 194, in the Appendix to the present Report.

In the following summary Table, XIX., the results of the whole 40 analyses of milk are so classified as to bring to view the chief points of interest.

TABLE XIX.—Mean per-centage Composition of the Milk produced from Unsewaged and Sewaged Grass, alone or with Oilcake in addition, and in different Seasons.

SEASONS 1861 and 1862.

	SEASON 1861.					SEASON 1862.	
	Cows fed on						
	Grass alone.		Grass and Oilcake.		Sewaged Rye-grass and Clover, and Oilcake.	Grass and Oilcake.	
	Unsewaged.	Sewaged.	Unsewaged.	Sewaged.		Unsewaged.	Sewaged.
Number of Analyses giving the Means	9.	10.	4.	4.	1.	6.	6.
Casein	3·246	3·241	3·352	3·423	3·125	3·513	3·467
Butter	3·604	3·430	3·657	3·707	3·473	3·834	3·559
Sugar of Milk, &c.	4·405	4·218	4·561	4·689	4·700	4·502	4·440
Mineral matter	0·753	0·776	0·740	0·771	0·752	0·753	0·771
Total solid matter	12·008	11·665	12·310	12·590	12·050	12·602	12·237
Water	87·992	88·335	87·690	87·410	87·950	87·398	87·763
	100·000	100·000	100·000	100·000	100·000	100·000	100·000

The average results of the numerous analyses of the milk of the season of 1861 showed a somewhat lower proportion of each of the constituents—casein, butter, sugar, &c.—and also of total solid substance, but a slightly higher proportion of mineral or saline matter in that from the sewaged than in that from the unsewaged grass, when, for a period of 16 weeks, the cows were fed on grass alone. But when, for a period of four weeks at the end of the season, oilcake was given in addition to the grass, the milk from the sewaged grass contained rather more instead of less of casein, butter, sugar, &c., and total solid matter, than that from the unsewaged; and both kinds of grass, although at the end of the season, gave, with oilcake in addition, milk containing more of each of the constituents mentioned than the grass of the earlier and more genial periods of the season when it was given alone.

In 1862 the season was very cold and wet, and the yield of milk, with cake given in addition to the grass throughout the season, was little if any better than during the period of the more favourable season of 1861, when the cows had grass alone. But both from unsewaged and from sewaged grass the milk of 1862, when oilcake was given, was somewhat richer than that of 1861 without it; and as during the longer period of 1861 when grass was given alone, so now in 1862 when cake was given throughout, the milk from the sewaged grass contained less solid matter, and was in fact somewhat less rich, than that from the unsewaged. This result of an entire season is, of course, more reliable than that obtained with oilcake during the concluding four weeks only of the season of 1861, which showed as above observed a rather

richer milk from oilcake and sewaged than from oilcake and unsewaged grass. Upon the whole it would appear probable that, under otherwise comparable conditions, unsewaged grass will give a slightly richer milk than sewaged, whether given alone or with other food in addition.

The general result is, that a given weight of fresh unsewaged grass, supplying as it did much more solid matter, gave more milk than an equal weight of the fresh sewaged grass; that a given amount of the dry or solid substance of the more succulent sewaged grass gave considerably more milk than an equal quantity of that of the unsewaged; that the addition of oilcake, whether to unsewaged or to sewaged grass, increased the richness of the milk: but that the milk from the sewaged grass (whether given alone or with oilcake) was somewhat less rich than that from the unsewaged.

XI. *Experiments on the application of Sewage to Oats in* 1863.

For reasons that have been already explained, the Commission did not think it desirable to undertake a systematic series of experiments with any other crops than grass. Indeed, so to have extended their inquiry, would have required much more ample funds than were at their disposal for experiments on the agricultural utilisation of sewage. By the kindness of Mr. J. A. Campbell, however, they are enabled to record the results of an experiment on the application of sewage to oats.

In the spring of 1863, in a field from which a crop of clover had been carried off in 1861, and in 1862 a crop of wheat, Mr. Campbell was about to give the then growing crop of oats a top dressing of nitrate of soda. Instead of this, four plots of about an acre each, were set apart and treated as follows:—

Plot 1. Left unmanured.
Plot 2. Sewaged at the rate of 135½ tons per acre.
Plot 3. Sewaged at the rate of 510 tons per acre.
Plot 4. Top-dressed with 1½ cwt. of nitrate of soda.

The applications of the sewage, and of the nitrate, were made much later in the season than was desirable. The sewage was applied from April 28 to May 16 inclusive; the two acres requiring, with the hindrance of gauging by means of a barrel, 16 days for the application by hose and jet of the small quantities stated. The nitrate of soda was sown broadcast, partly on April 24, and partly on May 4.

For several weeks from the time of sowing there was very little rain, so that the plant top-dressed with nitrate of soda was obviously injured by the application for some time, the foliage being much "burnt." The sewage, on the other hand, being applied during dry weather, and the application followed by a very unusally dry period, during which spring corn and even wheat crops were reputed over a considerable range of country to be suffering for want of rain, produced, as might be expected, very marked effects. Owing, too, to the small amount of rain,

the sewage was of more than the average concentration of that of Rugby, and probably about double the average strength of that of the Metropolis (including rain, &c.) The following Table (XX.) shows the results obtained.

TABLE XX.—Results of Experiments on the application of Sewage to Oats.

Rugby 1863.

Plots.	Manures.	Quantities per Acre.				Increase by Manure.		Particulars of Quality.		
		Dressed Corn.		Offal Corn.	Straw.	Corn.	Straw.	Weight per Bushel of dressed Corn.	Offal Corn to 100 dressed.	Total Corn to 100 Straw.
		Bush.	Pks.	Lbs.	Cwts.	Lbs.	Cwts.	Lbs.		
1	Unmanured - -	55	2½	85	42½	..	..	44	3·5	53·3
2	135½ tons sewage -	69	1½	212	53	658	10½	43	7·1	53·9
3	510 tons sewage - -	66	2½	302	61	565	18½	42	10·8	45·4
4	1½ cwt. Nitrate of Soda	54	0½	131	45½	—11	3	44	5·5	49·6

Thus, under the conditions of season described, there was with the nitrate of soda even rather less corn, and only about 3 cwts. more straw, than without manure, and the smaller quantity of sewage gave more increase of corn than the larger, though the latter gave considerably the most straw. Both the sewaged crops were, indeed, too luxuriant to bear up against the heavy rains of June, and the one with the largest amount of sewage was very much laid, and hence the deficient yield of corn in proportion to straw. The last three columns show, by the deficient weight per bushel of the dressed corn, the large proportion of offal corn, and the low proportion of corn to straw, where the largest quantity of sewage was employed, that the defective result as to corn in its case was due to over rather than to under luxuriance. In fact, the usual complaint when sewage has been applied to growing corn crops has been of over production of straw and deficient proportion of corn—that is to say, of a tendency of growth which is as unfavourable in the case of corn as it is favourable in that of grass.

There was, however, a very high gross money return per ton of sewage applied, at any rate where the smaller quantity only was employed. Thus, reckoning oats at 3*s.* per bushel, and oat straw at 20*s.* per load, the gross value of the increased produce from one ton of sewage was—

With 135½ tons of sewage per acre - 5¼*d.* per ton.
With 510 tons of sewage per acre - 1½*d.* per ton.

Here, then, with a small quantity of sewage of nearly double the average strength of that of the Metropolis, applied during a period of very dry weather, which was followed by a season of very unusual productiveness—the harvest of 1863 being the best for many years past—the gross value of the increased produce amounted to more than 5*d.* per ton of sewage employed, or to

nearly three times the market value of the constituents of the sewage supposing them to have been extracted and dried.

The smaller amount of sewage applied was equivalent in water to something under an additional 1½ inch of rain at the critical period of growth; and the larger amount was equal to about five inches, which would at that period have been a very great excess, and of itself caused rank and over luxuriant growth on any soil in such condition as the unmanured produce showed the one in question to have been. It is indeed difficult to say how much of actual result obtained was due to the manurial constituents, and how much to the water of the sewage. At any rate, whether considered with regard to the amount of manurial constituents supplied, or the amount of water, an average of 500 tons of sewage per acre to arable land otherwise treated in the ordinary way would most probably be found more than appropriate to the average of soils and seasons, and would most certainly be more than appropiate for heavy lands and for wet seasons; nor even in dry ones, when sewage would be worth a maximum value for some crops by virtue of its water, if applied at the proper time, would more than this amount be required the year round; though it is possible that the demand might be as much beyond the supply for a short period, as the supply would undoubtedly be beyond the demand for very much the greater part of the year so far as arable land was concerned.

XII. *Miscellaneous Results obtained in* 1864.

It has been already stated (Section VII. p. 45) that in order to ascertain whether the meadow land experimented on in 1861, 1862, and 1863 were left in a higher or in a lower condition by the application of sewage, and the removal of the produce during those three years, it was decided that the produce of each plot should, in 1864, be carefully weighed, sampled, and analysed, without any further application of sewage; and also that the soil of the respective plots should be so far submitted to chemical examination as time and other circumstances would allow. The results of this part of the inquiry will form the subject of the present Section.

Owing to the extraordinary drought of the season of 1864, it was, as will be readily understood, as unfavourable as it possibly could be for meadow land without either sewage or other manure. Indeed, from only one plot was any second cutting taken, and then only a few cwts. of green grass were obtained. In all other cases the after-grass came forward so late in the season that it was thought better to feed it off than to cut it.

The following Table (XXI.) shows the amounts of green grass obtained from each plot; and some particulars of the feeding of the remainder of the produce will be given further on.

TABLE XXI.—Produce of Green Grass obtained per Acre in 1864, without Sewage.

Plots.	Treatment in 1861, 1862, and 1863.	Five-acre Field.				Ten-acre Field.				Mean of the Two Fields.			
		Dates of Cutting.	Quantity.			Dates of Cutting.	Quantity.						
			tons.	*cwts.*	*qrs.*	*lbs.*		*tons.*	*cwts.*	*qrs.*	*lbs.*	*tons.*	*cwts.*	*qrs.*	*lbs.*
First Crop.															
1	Unsewaged	June 18—20	1	14	3	26	June 16 and 17	3	1	2	0	2	8	0	27
2	3,000 tons sewage per acre, per ann.	June 4—9	2	17	2	20	June 8—13	5	12	1	15	4	5	0	3½
3	6,000 tons sewage per acre, per ann.	May 24—30	5	12	0	18	June 1—7	7	4	0	9	6	8	0	13½
4	9,000 tons sewage per acre, per ann.	May 19—23,	5	9	0	17	May 26—June 1	6	11	0	11	6	0	0	14
Second Crop.															
4	9,000 tons sewage per acre, per ann.	Aug. 24	0	4	3	3	..	-	-	-	-	-	-	-	-

Small as were the amounts of produce on all the plots, it is nevertheless clear that there was much more growth where sewage had been applied in the preceding years than where it had not; and there was more where 6,000 than where 3,000 tons had been applied, even though the crop was in the former case cut some days earlier at the most active period of growth; and from the indications there would doubtless have been more still where 9,000 tons had been annually applied, but for the still earlier dates of cutting.

The evidence so far is, then, that the land was left in the higher condition of productiveness the larger the quantities of sewage applied, and of produce removed, in previous seasons; and although a second cutting was taken in only one instance, and when feeding off the after-grass the plots were not separated so as to afford exact evidence on the point, it may be stated that in both fields the amount of feed was obviously much the greater the greater the quantity of sewage previously applied. Indeed, it is concluded that in each field the plot 4 gave as much after-feed as plots 2 and 3 together.

In the ten-acre field the after-grass of the 4½ to 5 experimental acres kept 8 heifers, of about 7½ cwts. live-weight each, for 11 days, from Nov. 11 to Nov. 22; 104 sheep of about 160 lbs. average live-weight for 14 days, from Nov. 10 (morning) to Nov. 23 (evening); and 102 of the same sheep for 7 days from Dec. 7 to Dec. 14. The five-acre field, where the growth was not so good, kept 32 lambs, averaging about 90 lbs. live-weight, for 35 days from Nov. 18 to Dec. 23.

Further evidence of the effects of the unexhausted residue from the previous sewage manuring is to be found in the difference in the chemical composition of the produce from the respective plots. This point is illustrated by the results of analyses given in the following Table. For further details, *see* Appendix, Table XLII. p. 195.

TABLE XXII.—Composition of the Grass obtained in 1864, without Sewage.

	First Crop.								2d Crop.
	Five-acre Field.				Ten-acre Field.				Five-acre Field.
	Unsewaged.	Sewaged in 1861-2-3.			Unsewaged.	Sewaged in 1861-2-3.			Plot 4.
	Plot 1.	Plot 2.	Plot 3.	Plot 4.	Plot 1.	Plot 2.	Plot 3.	Plot 4.	
Per-cent. in the Fresh Grass.									
Dry Substance - -	34·70	30·19	28·12	20·33	33·36	30·84	23·63	21·50	55·53
Per-cent. in the Dry Substance of the Grass.									
Nitrogenous substance (N × 6·3) - - -	10·09	13·73	14·91	16·07	11·00	12·95	15·63	13·47	15·85
Fatty matter (ether extract) - - -	3·87	3·66	3·75	4·43	3·88	4·14	5·03	4·85	5·73
Woody fibre - -	26·64	26·64	27·61	28·21	27·36	27·12	28·21	26·94	29·02
Other non-nitrogenous substances - -	51·65	48·39	45·33	42·20	50·95	48·17	42·52	46·12	41·81
Mineral matter (ash) -	7·75	7·58	8·40	9·09	6·81	7·62	8·61	8·62	7·59
	100·00	100·00	100·00	100·00	100·00	100·00	100·00	100·00	100·00

The first point to remark is, that as the proportion of dry or solid substance was much lower in the earlier cut and less matured sewaged grass than in the later cut unsewaged grass, the difference in the relative amount of the produce per acre on the respective plots was in reality not so great at the actual dates of cutting as the amounts of fresh or green grass recorded in the Table would indicate. The lower per-centages of dry substance in the sewaged grass indicate indeed a less degree of maturity or ripeness at the time of cutting; and with these characters a higher per-centage of nitrogenous substance in the solid matter of the grass would be expected. But the differences in the per-centage of nitrogenous substance which the Table shows are greater than can be accounted for by the earlier or later cutting, and consequent less or greater degree of ripeness.

The solid matter of the unsewaged produce of the one field contained 10, and of the other 11 per cent. of nitrogenous substance; whilst in that of the produce from the previously sewaged plots it ranged from about 13 to about 16 per cent., and was, with one exception, the higher the greater the quantity of sewage previously applied.

It has been shown in Section VIII. that the proportion of nitrogenous substance in the solid matter of the grass was much increased under the influence of sewage, and the results here recorded, taken together with those relating to the amounts of produce per acre, clearly show a considerable effect from the unexhausted residue from the previous sewage manuring, even in so extremely unfavourable a season; and it would doubtless have

been much greater under more favourable circumstances, and will probably be manifest for some time to come.

Although the amount and the composition of the grass obtained in 1864 have clearly shown the effect of the previous sewage manuring, the only partial investigation to which the soils have been submitted does not further illustrate the point. Calculation would, indeed, seem to indicate that there had been considerable accumulation, at a greater or less depth within the soil, of some of the most important manurial constituents of sewage where the larger quantities had been applied, but it was not thought desirable to incur either the necessary delay or the increased expenditure which a sufficiently detailed investigation of the subject would involve.

The results obtained are, however, of considerable interest as showing a very great difference in the character and composition of the soils of the two fields, which to a great extent explains the marked difference in the amount of produce which they respectively yielded without sewage.

Appendix Table XLIII. p. 196, shows the great difference in the general character, and Table XLIV. p. 197, in the chemical composition in some important respects, between the two soils.

It will be recollected that the unsewaged portion of the ten-acre field each year yielded much more produce than that of the five-acre field. The former was known to have a heavier soil, and a more sunny aspect; but these differences were not recognised as fully accounting for the great difference in the natural productiveness. The results of the partial mechanical and chemical analysis show, however, that, within a layer of 9 inches, taken immediately below as thin a sod as could be first removed, the lighter, gravelly, and naturally less productive soil of the five-acre field contained an average of nearly 20 per cent. of stones, whilst similar layers from the ten-acre field did not on the average contain half as much. Again, the separated fine mould from the soil of the five-acre field was sandy, contained about 15 per cent. of moisture, between 5 and 6 per cent. of organic matter, and scarcely one fifth per cent. of nitrogen, whilst that of the more productive ten-acre field was loamy, containing a good deal of clay, about one fourth more moisture, more than one half more organic matter, and about one third more ammonia, or nitrogen in some other form. Or, comparing the composition of the total fresh soils, including stones, instead of that of the separated fine moulds, the differences are in a still greater degree in favour of the soil of the ten-acre field, so far as the indications of natural fertility are concerned.

It is, however, very satisfactory to know, that the soil of the much less naturally fertile five-acre field gave fully as much produce per acre under the influence of liberal dressings of sewage, as that of the naturally much more productive ten-acre field. This result is quite confirmatory of the general opinion, founded on the results of practical experience, that light, and even naturally poor and unproductive soils, are capable of yielding very large crops of grass under the influence of sewage, and that they are, in fact, the best suited for its application.

XIII. *Concluding Observations; general Considerations on the Agricultural Utilisation of Town Sewage.*

There cannot be a doubt that to obtain a maximum amount and gross value of produce from a given amount of sewage it should be applied in small quantities per acre, and in dry weather. But it is clear that the maximum value per ton of sewage which would be obtainable under such conditions would be available only for short periods of the year; and, it is equally certain, that the constant daily supply, the year round, would, at all other times, have to be disposed of at a very different rate, thus reducing the average value very considerably. It is obvious, indeed, that even supposing sewage were distributed over a sufficiently large area to command its full value, both as manure and as water, at the best periods of the year, the much larger remainder must either be sacrificed, or at the best used for grass at periods when its value even for that crop must be very much reduced.

Even assuming that during any considerable portions of each year the Metropolitan sewage would be worth to the farmer 2*d.* per ton distributed over his arable land, there can still be no doubt that the average value the year round would be reduced to considerably below 1*d.* by the use of the remainder in large quantities to grass at the less favourable periods of the season.

Adopting the favourable supposition that as high an average as 500 tons of sewage per acre could be utilised on arable land, and that as low an average as 5,000 tons per acre were found sufficient for Italian rye and meadow grass, the important practical questions arise—would the increased productiveness, and increased gross money return per ton, in the former case, justify the extra cost of distribution over a ten-fold area, and to a great extent by pipes and hose and jet instead of by open runs?—or, having regard, not to the greatest amount of produce and of gross money return, but to the greatest profit, per ton of sewage, would it not be far more remunerative to limit the area, and cost of distribution, at a certain sacrifice of the productiveness of the sewage?

The probability is, however, that the difference of area required under the two systems would be greater than that here assumed for the purpose of illustration; and then, of course, the difference in the cost of distribution of a given amount of sewage would be still further increased. In fact, to utilise the constituents of the Metropolitan sewage over an area at all corresponding to the rate per acre of the smaller and more productive application to oats at Rugby, it would require more nearly a twenty-fold than a ten-fold area as compared with that of such an application to grass land as above supposed.

The great dilution of the Metropolitan sewage, indeed of town sewage generally, its large daily supply at all seasons, and its greater amount in wet weather when the land can least bear, or least requires, more water, render it extremely inappropriate for application on a comprehensive scale to arable land for the growth of corn and other ordinary rotation crops. But, apart from these difficulties, if it can only be distributed in small quantities over large areas at such a cost to the farmer as has as yet been pro-

posed, it is indeed vain to hope that any large proportion of the manurial constituents derived from the consumption of human food in our towns, can be distributed over the area from which they came.

A modified proposition is, to make arrangements for delivering the sewage over a large area, and to all crops, so as to obtain a high price per ton for so much as can be applied under the most favourable conditions of the land, the crop, and the season, having in reserve a sufficient tract of grass land to purify and utilise the surplus not so available. But this surplus would be very large, and the largest at those periods of the year when of the least value even for grass land, so that the gross value per ton of sewage the year round would be very much reduced.

Having regard to the cost of distribution, it is probable that a much more profitable mode of utilisation would be, to limit the area by specially adapting the arrangements for the application of at any rate the greater part, if not the whole, to permanent or other grasses, laid down to take it the year round, trusting to the occasional use to other crops within easy reach of the area so commanded, but relying mainly on the periodically broken up rye-grass land, and on the application to arable land of the solid manure resulting from the consumption of the sewaged grass, for obtaining other produce than milk and meat by means of sewage.

The question arises—how much land would be requisite for the purification and utilisation of the sewage of a given population on such a plan?

Putting out of view, for the moment, the sanitary consideration of the sufficient purification of the sewage, and the economical one of the manurial value of its constituents, and looking merely to obtaining the largest possible amount of green produce from a given area of land, there is scarcely any limit to the amount of sewage that might be employed, even up to 40,000 or 50,000 tons per acre per annum. But, so far as existing experience furnishes data for a judgment on the point, it may be concluded that the use of about 5,000 tons per acre, judiciously applied to grass land properly laid down to receive it, would, in a great majority of cases, secure the most profitable utilisation. Where, however, the drainage from the sewaged land must be turned into a river, other considerations than those relating only to the most profitable utilisation at once arise. Such an application as is here supposed would doubtless ensure a sufficient purification of the water to admit of its being turned into rivers without fear of detriment to fish; whilst, any streams receiving such drainage instead of that direct from the towns would, at any rate, be vastly improved from their previous condition as a water supply for other towns; but, whether or not, when this most important point has to be taken into consideration, the purification would be sufficient with an application of as much as 5,000 tons per acre per annum, is a question which requires the aid of further experience, and

further investigation, to answer satisfactorily, and which may, indeed, receive a different answer in different cases.

Assuming that the excretal matters of each individual of the Metropolitan area are, or will be, on the average, diluted with 100 tons of water per annum, including water supply, rainfall, and subsoil water, 5,000 tons of sewage would be contributed by fifty individuals in a year, and at this rate, a population of 3,000,000 would require, for the purification and utilisation of its sewage, an area of about 60,000 acres annually under irrigation. So far as Italian rye grass were grown, it might be estimated that the land devoted to it would one year in three be broken up, and some other crop be grown upon it, and to a corresponding extent the area laid down for irrigation would require to be extended beyond the 60,000 acres supposed. Then again, it is obvious that the manure produced by the consumption of the sewaged grass must either be re-distributed by means of water, in which case the area under actual irrigation would be again increased, or, if collected and used in the solid form, it would be appropriate for application to arable land, and so to the growth of corn and other products; and it is obvious that for the most profitable utilisation in this way of the manure derived from the consumption of the sewaged grass, such arable land would require to be either within the area laid down for irrigation, or so near its limits as to reduce the cost of carriage as far as possible.

The experiment with oats above referred to, and that with wheat made by the Chairman of the Commission, the Earl of Essex, the results of which his lordship gave in his evidence before the Sewage Committee of 1862, are the only cases in which exact quantitative results have been recorded of the effects of sewage applied to corn crops.

In the case of the experiment of the Earl of Essex, nothing is known of the strength of the sewage, and nothing is recorded of the characters of the season.

In the case of those with oats at Rugby, as already observed, the sewage was stronger than the average of that of Rugby, and much stronger than the average of that of the Metropolis, the weather was unusually dry at the time of the application, and the season was upon the whole one of very extraordinary productiveness, and, under these conditions, a very high gross return was obtained for a given amount of sewage. Judging from the results of the Earl of Essex, it is probable that the circumstances, both as to the strength of the sewage and character of the season, were in his case also unusually favourable.

At any rate, these isolated results, the one obtained under conditions known to be far above an average character, and the other under entirely unknown conditions, are obviously quite inappropriate as the basis for general conclusions as to the probable average results obtainable on the application of sewage to arable land for corn and other rotation crops.

It is, indeed, desirable that systematic trials should be made with different corn and other rotation crops, through several consecutive seasons, and that the results should be accurately recorded for the guidance of the public.

Although there is still wanting evidence of an exact and quantitative kind upon which to found estimates of the probable average results obtainable over various seasons, on the application of given quantities of sewage, of known strength, to corn and other rotation crops, yet evidence of common experience as to the applicability, in a practical or economical point of view, of sewage to such crops, is by no means wanting. The most extensive and systematic trials have been made at Rugby, Watford, and Alnwick.

At Rugby, the sewage from a population of between 6,000 and 7,000 individuals is collected in a receiving tank, from which it is pumped by a 12-horse power engine through iron pipes which are laid down for the distribution over 470 acres of mixed grass and arable land. These arrangements have been in existence for about 11 years. About 190 acres of the land so piped have, from the commencement, been held by J. A. Campbell, Esquire. But he has gradually limited the area of application, until, during the last few years, he has abandoned the use of the hose and jet, excepting occasionally on a small scale, and confined the application almost exclusively to from 12 to 20 acres of meadow and Italian rye grass. The greater part of the remainder of the 470 acres was, for some time previous to 1861, held by Mr. Berry Congreve, who, after trying sewage on arable as well as grass land, was glad to give up his holding, after having sustained considerable loss. The present tenant of the sewage works, and of the land formerly held by Mr. Congreve, is Mr. Bicknell Mullins, who entered into the occupation in 1861, and although he had between 250 and 300 acres laid down for the application of sewage to crops generally, and by hose and jet, he in practice confines it to about 100 acres of grass land, and applies it almost entirely by open runs.*

The result at Rugby is, then, that after about eleven years of practical experience, with arrangements adapted for the application of sewage to arable land, and to all crops, its use to any other crops than meadow and Italian rye grass forms no part of the general system adopted, and is, in fact, entirely exceptional.

In the neighbourhood of Watford, the Earl of Essex laid down pipes for the application of the sewage of the town by hose and jet to about 210 acres of mixed arable and grass land. The result which his lordship obtained on the application of only 134 tons of sewage to an acre of wheat has frequently been held to be conclusive proof of its applicability in small quantities, over large areas, and to all crops. But, in the evidence given by his lordship before the Sewage Committee of 1862, he stated, very

* Since the above was in type Mr. Mullins has informed us that during the dry season of 1864 he applied sewage to about four acres of roots, and apporently with good results.

emphatically, that his great error had been the piping of too much land; that the sewage of Watford, derived from a population of about 4,000, was not sufficient for more than about 60 or 70 acres; that he required 5,000 tons per acre for 10 acres of rye-grass; and that applying the remainder to 35 acres of meadow, he really had none to spare for wheat. It should be added, that, since the date of this evidence, the area of application has been still further contracted.

In other words, the result at Watford is, that although the abandonment of one acre of rye-grass would set free sewage enough for nearly 40 acres of wheat, if only applied at the rate which yielded the large profit which has been so frequently quoted, yet his lordship's practical experience has led him to prefer the application to the one acre of rye-grass, rather than to the nearly 40 acres of wheat.

In the neighbourhood of Alnwick, the Duke of Northumberland, some years ago, put down machinery and piping for the distribution of the sewage of from 6,000 to 7,000 individuals, over about 270 acres of mixed arable and grass land. It was applied in small quantities to various rotation crops, and in larger quantities to grass; but after a very short time the tenants who had the free use of the sewage for the cost of its application, entirely abandoned it; and the Bailiff of the district, who reports the failure, expresses his opinion strongly against the applicability of sewage to arable land. The failure at Alnwick has been attributed by those connected with the undertaking, to the great dilution of the sewage; and the analyses recorded of it would indicate a composition even much below that of the probable average of the Metropolitan sewage. But Mr. Rawlinson, who directed the sewerage arrangements at Alnwick, states, that not only are water-closets universal, but that the supply of water from all sources is certainly very much lower per head of the population contributing to the sewage there than in the case of the Metropolis; and it is obvious that, if this be the case, the average sewage must be in a corresponding degree the stronger.

At Edinburgh sewage has been applied to some portions of grass land for about 200 years, to a considerable portion for more than 60, and to most of the land now under irrigation, amounting to about 395 acres, for more than 30 years. It is there that larger amounts of sewage are applied per acre than anywhere else, and it is there that larger amounts of produce are obtained per acre than anywhere else. There is, however, no doubt, that at Edinburgh there is not only great waste of manurial constituents, but very imperfect purification of the sewage. The distribution is entirely by means of open runs. In two instances arrangements have been made for raising the sewage, by pumping, an inconsiderable number of feet; but it has been found that the cost has been too great to allow a sufficient quantity to be applied per acre, and hence the application in this way has been much limited, if not on some portions of the land entirely aban-

doned. The application to ordinary rotation crops, on arable land, forms no part of the system adopted at Edinburgh.*

Next to Edinburgh, the attempt to utilize sewage on a large scale which has been the most succesful so far as the amount of produce obtained per acre is concerned, is that of Mr. Marriage in the neighbourhood of Croydon, where about 250 acres of meadow and Italian rye grass annually receive an amount of sewage which averages rather more than 6,000 tons, and represents the excretal matters of between 60 and 70 persons per acre per annum. As, however, the fluid is always passed over several portions of land in succession, by which means a considerable portion is used on an average about $2\frac{1}{2}$ times over, it results that each acre receives annually $6{,}000 \times 2{\cdot}5 = 1{,}5000$ tons of fluid—*less* the amount which evaporates or passes off below the drains which collect and carry it off from one portion to be utilised on another. An enlargement of the area is, indeed, contemplated, which, notwithstanding the rapid increase of the population of the neighbourhood, will, if carried out as proposed, somewhat reduce the amount of fluid and of excretal matters available per acre below the quantities above stated. Mr. Marriage has not yet applied sewage in any systematic manner to arable land; but he was intending to try its effects upon root-crops during the past season (1864).†

In attempting to estimate by the aid of the evidence afforded by these various trials on a large scale, carried out by practical men with a view to profit, the value to the farmer of a ton of town sewage, we may, on account of the conditions above stated, exclude the Edinburgh results from our consideration.

At Croydon, again, the undertaking is of too recent establishment, the results have been obtained over too few seasons, and the present contract was made, on either side, under such disadvantages or uncertainty, that the experience there does not provide the adequate data for such an estimate. It may be observed, however, that after deducting £4 rental from the estimated gross value of the produce per acre at present prices, the gross return is, so far as can be calculated, with Italian rye grass from $\frac{3}{4}d.$ to $1d.$, and with meadow grass from $\frac{1}{2}d.$ to $\frac{3}{4}d.$ for each ton of sewage employed. But there can be little doubt, that if the supply of such produce were very greatly increased, the present market price would not be maintained.

At Rugby, where for about eleven years arrangements have been made for the distribution of small quantities of sewage over a large area, and to all crops, and where the sewage is much stronger than that of the Metropolis, the cost to the tenants averages about $\frac{3}{4}d.$ per ton delivered at the hydrants in the fields. Yet, both the present tenants have been glad, rather than incur the loss of using the sewage themselves at that cost, to get rid of it for the purposes of these experiments, at rates which,

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* For further particulars relating to the Edinburgh sewage meadows, see Appendix No. 2. p. 198, et seq.

† For further details relating to Croydon, see Appendix No. 3. p. 202, et seq.

though three times as high during the six summer as during the six winter months, have averaged the year round scarcely, but very nearly, 1*d.* per ton at the hydrants.

Lastly on this point, in his evidence before the Sewage Committee of 1862, the Earl of Essex stated, as the result of his experience, which it will be remembered included the very favourable result with wheat, that in his opinion sewage would not be profitable to the farmer unless he could have it at from $\frac{1}{2}d.$ to $\frac{3}{4}d.$ per ton.

The experiments at Rugby to which this Report refers, having been conducted on feeding meadow land of more than average quality, the produce without sewage was doubtless considerably more than would be obtained from the average of such land as is likely to be devoted to the growth of grass by means of sewage on the large scale. For this reason, and also on account of the less perfect purification and utilisation of the sewage than would be attained where a large tract were so laid down as to allow of the passage of the fluid from one plot over a second, and so on, until it were properly exhausted, the amounts, and value, of the increase estimated according to the actual results of the experiments as due to the application of given quantities of sewage, are probably below those which would be attainable under good management in actual practice on the large scale.

Reviewing the whole of the results, both of the experiments and of the experience of common practice on the subject hitherto, with due regard to the circumstances under which they were obtained, and having regard also to both urban and rural interests, it is considered that an application of about 5,000 tons of sewage per acre per annum, to meadow or Italian rye grass, will, in a great majority of cases, prove to be the most profitable mode of utilisation. It is at the same time considered pretty certain that the farmer would not pay $\frac{3}{4}d.$, and even very doubtful whether he could afford to pay $\frac{1}{2}d.$ per ton, the year round, for sewage of the average strength of that of the Metropolis (excluding storm water) delivered on his land.

Summary.

The results of the whole inquiry may be briefly enumerated as follows:—

1. As there is a daily supply of sewage the year round, which, on sanitary and engineering grounds, it is essential to dispose of as soon as it is produced, and as passing it over land is the best mode both of purifying and utilising it, it should be employed for purposes of irrigation, and be applied in winter, when of comparatively little value, as well as in summer, when of more.

Results obtained on the Application of Sewage to Meadow and Italian Rye Grass.

2. By the application of sewage to grass land during the winter months a very early cut or bite of green food may be obtained, but the amount of increased produce due to the winter application is comparatively small for the amount of sewage employed.

3. By means of sewage irrigation the period during which an abundance of green food was available was extended considerably a the end as well as at the beginning of the season, and the more so the larger the quantity of sewage applied, almost up to the highest amount employed—namely, 9,000 tons per acre.

4. One of the experimental fields gave much less produce per acre without sewage than the other, and analysis showed its soil to be much less naturally fertile; but it gave fully as much produce per acre under the influence of liberal dressings of sewage as the naturally much more fertile soil.

5. Taking the average over three years, and in the two fields, the amount of produce obtained without sewage was about $9\frac{1}{4}$ tons, of green grass per acre per annum, equal about 3 tons of hay; and with 3,000, 6,000, and 9,000 tons of sewage per acre per annum the amounts were, respectively, about $22\frac{1}{4}$, $30\frac{1}{4}$, and $32\frac{1}{2}$ tons of green grass—equal respectively (reckoned according to the percentage of dry substance in each) about 5, $5\frac{3}{4}$, and $6\frac{1}{2}$ tons of hay.

6. The largest quantities of produce per acre were obtained in the third year of the experiments, and with 9,000 tons of sewage per acre per annum; namely, in one field 35 tons, and in the other 37 tons of green grass, equal respectively about 6 tons $12\frac{3}{4}$ cwts., and 7 tons 1 cwt., of hay.

7. The average increase obtained for each 1,000 tons of sewage was—when 3,000 tons per acre per annum were applied, about 5 tons of green grass; when 6,000 tons were applied, 4 tons $2\frac{1}{2}$ cwts.; and when 9,000 tons were applied, 3 tons $3\frac{1}{4}$ cwts. of green grass.

8. The amouut of produce per acre was the greater the greater the quantity of sewage applied, up to 9,000 tons per acre; but the amount of increase of produce obtained for a given amount of sewage was the less where the greater amounts were applied.

9. Experiments with rye grass were made in one season only, sewage was not applied until the end of April, and comparatively small quantities were put on. The results so obtained indicated much about the same amount of increase of produce for a given amount of sewage as with meadow grass.

Results obtained with fattening Oxen.

10. When cut and given to fattening oxen tied up under cover, more sewaged than unsewaged grass, reckoned in the fresh or green state, was both consumed by a given weight of animal within a given time, and required to produce a given weight of increase; but, of real dry or solid substance, less of that of the sewaged than of the unsewaged grass was required to produce a given effect.

11. When cut grass was given alone the result was very unsatisfactory; but when oilcake was given in addition the amount of increase upon a given weight of animal within a given time, and for a given amount of dry substance of food consumed, was not far short of the average result obtained when oxen are fed under cover on a good mixed diet.

12. The money return, whether reckoned per acre or for a given amount of sewage, was much less with fattening oxen than with milking cows.

Results obtained with milking Cows.

13. When cows were fed on unsewaged, or sewaged grass, as much as they chose to eat, a given weight of the animal was more productive, both of milk and increase, but especially of milk, on the unsewaged than on the sewaged grass.

14. From a given weight of unsewaged grass, reckoned in the fresh or green state, more milk was produced than from an equal weight of fresh sewaged grass; but a given weight of the dry or solid substance supplied in sewaged grass was on the average more productive than an equal weight supplied in unsewaged grass.

15. The milk producing quality of the grass was very different in different seasons, and at different periods of the same season. It was very inferior in the wet and cold season of 1862, and towards the close of the seasons as compared with the earlier periods. It appears probable that Italian rye grass deteriorates less towards the end of a season than meadow grass. On the average, about six parts by weight of fresh grass yielded one part by weight of milk.

16. By the aid of sewage, the time that an acre would keep a cow, and the amount of milk yielded from the produce of an acre, were increased between three and four-fold.

17. So far as the results of the experiments afford the means of judging, it is estimated that with an application of about 5,000 tons of sewage per acre per annum to meadow land, an average gross produce of not less than 1,000 gallons of milk per acre per annum may be expected.

18. In experiments conducted with Italian rye grass (but in one season only), more milk was obtained by the use of a given amount of sewage applied to it than to meadow grass.

19. With an application of about 5,000 tons of sewage per acre per annum, an average gross return of from 30*l.* to 35*l.* per acre, in milk at 8*d.* per gallon, may be anticipated.

Composition of the Rugby Sewage.

20. The mean of 93 analyses, of as many samples, of the Rugby sewage, collected over a period of 31 months, shows 6½ grains of ammonia, and 87½ grains of total solid matter, per gallon; equal to 207¾ lbs. of ammonia, and 2,803 lbs. of total solid matter per 1,000 tons. Or, taking the mean of the average composition fixed by the analyses for each of the 31 months, instead of the direct mean of the total 93 analyses, the average contents would be almost exactly 7 grains of ammonia, and 92½ grains of total solid matter per gallon; equal to 224 lbs. or 2 cwts. of ammonia, and 2,960 lbs., or about 26½ cwts. of total solid matter, per 1,000 tons.

21. Although each sample analysed was the mixture of portions taken every two or three hours for several days together, the variation in composition at different times was very great; the amount of ammonia varying in the different mixed samples from 2½ to about 15½ grains per gallon, or from 81½ to 500½ lbs. per 1,000 tons, whilst the total solid matter varied from about 37½ to about 270 grains per gallon, or from 1,203 to 8,637 lbs. per 1,000 tons.

22. 1,000 tons of the average sewage of Rugby represent the excretal and other matters of from 17 to 18 average individuals of a mixed population of both sexes and all ages for a year, and contain ammonia equal to that in from 11 to 12 cwts. of Peruvian guano; or, about 1,700 tons of such sewage would contain nitrogen reckoned as ammonia equal to that in 1 ton of Peruvian guano.

23. It is estimated that there are at Rugby, including rainfall, &c., on the average from 55 to 60 tons of sewage per head of the population per annum.

24. Judging from the average composition of the Rugby sewage, and of various crops, it is concluded that potass would be more likely than phosphoric acid to become deficient where town sewage was applied constantly to grass-land, whilst phosphoric acid would be more likely to become deficient than potass if it were applied to the ordinary crops of rotation.

Estimated average Composition of the Metropolitan Sewage.

25. There is as yet no record of the analysis of any samples or sample of sewage collected under circumstances fairly to represent the average Metropolitan sewage either with or without rainfall and subsoil water.

26. It is estimated that the Metropolitan sewage amounts on the average to about 60 tons without, and probably to about 100 tons with, rainfall and subsoil water, per head of the population per annum.

27. It is estimated that, including human excretal and other matters, there are annually contributed to the Metropolitan sewage about 12½ lbs. of ammonia per head of the mixed population of both sexes and all ages.

28. Reckoned according to the currently adopted trade prices of the several constituents, taking dry and portable manures as the standard, the total annual value of the manurial constituents contributed to the sewage, supposing them to be extracted and dried, would amount to 8*s.* 4*d.* per head of the population.

29. Accordingly, in the dry weather sewage of the Metropolis, reckoned at 60 tons per head per annum, there will be about 6½ grains of ammonia per gallon, and the manurial constituents in 1 ton, if extracted and dried, would be worth about 1⅔*d.*; and in the average sewage with rainfall, &c., reckoned at 100 tons per head per annum, there will be scarcely 4 grains of ammonia per gallon, and the total manurial constituents in 1 ton will have an estimated value of 1*d.*

30. 1,000 tons of the average Metropolitan sewage without rainfall, reckoned at 60 tons per head per annum, represent the excretal and collateral manurial matters from nearly 17 average individuals, and contain ammonia equal to that in about 11 cwts. Peruvian guano; and 1,000 tons with rainfall, reckoned at 100 tons per head per annum, represent the manurial matters from 10 average individuals, and contain ammonia equal to that in about 6½ cwts. Peruvian guano. In other words, about 1,800 tons of the average Metropolitan sewage without, and about 3,000 tons of the average sewage with rainfall, &c., would contain nitrogen reckoned as ammonia equal to that in 1 ton of Peruvian guano.

31. The value of the total manurial constituents in sewage, reckoned according to the currently adopted trade prices of the several constituents, taking dry and portable manures as the standard, is pretty exactly indicated by putting a value of 8*d.* on every lb. of ammonia, or by giving a value of one farthing per ton for every grain of ammonia per gallon of the sewage. But this theoretical value, according to composition and the trade prices of the constituents, cannot, of course, be taken as directly indicating the value realized, or realizable, by the agricultural utilisation in various ways, of sewage of different strengths.

32. It is very desirable that as soon as the Main Drainage system is sufficiently advanced and in practical working, competent persons should be appointed to undertake the gauging, sampling, and analysis, of the Metropolitan sewage, in such manner as satisfactorily to determine its average composition in the condition in which it will have to be dealt with in any plan of utilisation.

Composition of the Drainage Water (*Rugby*).

33. Analyses of the drainage water passing from the experimentally sewage-irrigated land at Rugby showed that those constituents which are of the most value, because the most liable to become relatively exhausted, had been the most efficiently retained by the soil, but that the water still contained a considerable amount of valuable manurial matters, besides a large quantity of other substances less important as manure, but affecting the purity of the water.

34. When large quantities of sewage are applied to grass land the arrangements should be such as to allow of the water being used more than once, so that both the utilisation and the purification may be as complete as possible.

Chemical Composition of the Grass.

35. The sewaged meadow grass, as cut and given to the animals, contained a less proportion of dry or solid substance than the unsewaged; and the grass cut during the later portions of the season (both unsewaged and sewaged) contained less solid matter than that cut during the more genial periods of growth.

36. Italian rye grass, in the condition as cut, was also found to be more succulent and to contain less solid matter when grown with sewage than without it; but the proportion of dry substance diminished less as the season advanced in its case than in that of the meadow grass.

37. The proportion of nitrogenous substance (and also of impure waxy or fatty matter) was much greater in the solid matter of the sewaged, than in that of the unsewaged grass. The proportion of nitrogenous substance was also much higher in the solid matter of the grass grown towards the end than earlier in the season. The proportion of indigestible woody fibre was much about the same in the dry substance of the unsewaged and of the sewaged grass. It progressively diminished as the season advanced, and was generally lower in the dry substance of the Italian rye than in that of the meadow grass.

38. A given amount of the dry substance of grass grown in a cold and wet season, or during the cold and wet periods of the year, generally contains more nitrogenous substance, but is less productive than that of grass grown in more genial weather.

39. The greater productiveness in milk and increase of a given amount of the solid matter of the sewaged grass appears to depend more on a favourable condition of maturation, digestibility, and assimilability, of the constituents, than on the actual per-centage amount of any of those determined, and above ennmerated.

Effects of Sewage on the mixed Herbage of Grass Land.

40. The effect of sewage irrigation on the mixed herbage of grass land is to develop the Graminaceous plants chiefly, nearly to exclude the Leguminous, and to reduce the prevalence of miscellaneous or weedy. plants, but much to encourage individual species.

41. Among the grasses which have been observed to be the most encouraged by sewage are (according to locality or other circumstances) rough meadow grass, couch grass, rough cock's foot, woolly soft grass, and perennial rye grass; two or three only remaining in any considerable proportion after sewage has been liberally applied for some years.

42. The produce of sewage irrigated meadows being generally cut or grazed very young, the tendency which the great luxuriance of a few very free growing grasses has to give a coarse and stemmy later growth is not an objection as in the case of meadows left for hay; a given weight of the dry or solid substance of the more simple sewaged grass being, when consumed green, more productive than an equal weight of that of the more complex unsewaged herbage.

Composition of the Milk from the unsewaged and the sewaged Grass.

43. Although more milk was obtained from a given weight of the dry or solid substance of sewaged than of unsewaged grass, there was comparatively little difference in the composition or

richness of the milk from the two kinds of grass. That from the sewaged grass was, however, slightly the less rich, containing somewhat less of casein, butter, sugar, and total solid matter (though more mineral matter) than that from the unsewaged.

44. When oilcake was given with the grass (whether sewaged or unsewaged) the richness of the milk was notably increased.

Results obtained on the Application of Sewage to Oats.

45. In an experiment with oats in which 135½ tons of sewage were applied per acre, the gross value of the increased produce amounted to more than 5*d.* per ton of the sewage employed, or to about three times the market value of the constituents of the sewage, supposing them to have been extracted and dried; and in another experiment in which 510 tons were applied per acre, the gross value of the increased produce amounted to about 1½*d.* per ton of the sewage employed.

46. In the experiment with the smaller quantity of sewage the supply of water was equivalent to something under an additional 1½ inch of rain at the critical period of growth, and in that with the larger amount to about 5 inches, which proved to be a great excess at the period of the season at which it was applied, there being an over production of straw, and the crop being much laid. Both experiments were made in the unusually productive season of 1863, and with sewage of about double the average strength of that of the Metropolis, which was applied during a period of very dry weather. It is obvious, therefore, that the results were quite exceptional, and cannot be taken as indicating what might be expected from the application of small quantities of sewage to corn crops on different soils, and on the average of seasons.

47. It is probable that 500 tons of sewage per acre is more than would be appropriate to arable land otherwise treated in the ordinary way, taking the average of soils and seasons; and it is certainly more than would be appropriate for heavy lands, and for wet seasons.

General Conclusions.

48. To obtain a maximum amount and gross value of produce from a given amount of sewage, it should be applied in small quantities per acre, and in dry weather; but the great dilution of town sewage, its large daily supply at all seasons, and its greater amount in wet weather, when the land can least bear, or least requires, more water, render it quite inappropriate for application on a comprehensive scale to arable land for corn and other ordinary rotation crops.

49. Supposing arrangements were made for distributing sewage over a sufficiently large area to command a full value, both as manure and as water, at the most favourable periods of the year, the cost of main distribution would be very great, the application to the arable land would require to be chiefly by the expensive means of piping and hose and jet, instead of open runs, and but a

small proportion of the total sewage could be so used, leaving the remainder to be applied in large quantities to grass-land, at the less favourable periods of the year, and, of course, to realize a much lower value.

50. Having regard to the cost of distribution, it is probable that the most profitable mode of utilisation would be to limit the area by specially adapting the arrangements for the application of the greater part, if not the whole, to permanent or other grasses laid down to take it the year round, trusting to the occasional use to other crops within easy reach of the line or area so commanded, but relying mainly on the periodically broken up rye-grass land, and on the application to arable land of the solid manure resulting from the consumption of the sewaged grass, for obtaining other produce than milk and meat, by means of sewage.

51. It is probable that about 5,000 tons of sewage per acre, judiciously applied to grass-land properly laid down to receive it, would, in a great majority of cases, secure the most profitable utilisation.

52. Supposing an application of 5,000 tons of sewage per acre per annum to grass land, the purification of the water would doubtless be sufficient to admit of the drainage being turned into rivers without fear of detriment to fish; whilst any streams receiving such drainage instead of that direct from the towns would at any rate be vastly improved from their previous condition as a water supply; but whether the purification would be sufficient with such an application is a question which requires further experience and investigation to answer satisfactorily, and which will probably receive a different answer in different cases.

53. Assuming that the average dilution of the Metropolitan sewage, including rainfall and subsoil water, will amount to 100 tons per head per annum, 5,000 tons would represent the excretal and other matters of 50 average individuals; and a population of 3,000,000 would require about 60,000 acres constantly under irrigation.

54. The only records of exact quantitive results obtained on the application of town sewage to corn crops are those of the experiments of the Earl of Essex on wheat, and those of the experiments with oats at Rugby given in this Report, and in both cases the increase of produce represented a very high gross money return per ton of sewage employed. The circumstances of the experiments at Rugby were, however, quite exceptional; and, where the most extensive trials of the application of sewage to corn crops have been made with a view to profit, namely, at Watford, Rugby, and Alnwick, the practice has been abandoned; whilst neither at Edinburgh nor Croydon, where the best results have been obtained with grass, does the application to corn and other rotation crops constitute a part of the general system adopted.

55. Judging both from the results of the experiments, and from the experience of common practice, it is considered that the most

profitable utilisation of town sewage will in most cases be attained by the application of about 5,000 tons per acre to meadow or Italian rye grass; but that the farmer would not pay $\frac{3}{4}d.$, and probably not $\frac{1}{2}d.$, per ton, the year round, for sewage of the average strength of that of the Metropolis (excluding storm water), delivered on his land.

JOHN BENNET LAWES.

J. THOMAS WAY.

APPENDIX.

APPENDIX No. 1.

Detailed Records relating to the Experiments made at Rugby.

Table I.

Detailed Record of the Sewage applied to Permanent Grass Land. Second Season 1861–2.

Dates.	Five-acre Field.					Ten-acre Field.				
	Average time taken to fill Gauge-tank (3·216 tons).	Time of application.	Sewage applied (calculated per acre). Plot 2. (Area ·99375 acre.)	Plot 3. (Area ·92081 acre.)	Plot 4. (Area 1·00512 acre.)	Average time taken to fill Gauge-tank (3·216 tons).	Time of application.	Sewage applied (calculated per acre). Plot 2. (Area ·9875 acre.)	Plot 3. (Area ·99588 acre.)	Plot 4. (Area 1·00019 acre.)
	Mins.	H. M.	Tons.	Tons.	Tons.	Mins.	H. M.	Tons.	Tons.	Tons.
Nov. 4	15·50	2 45	..	..	34·06	9·50	2 0	41·14	..	..
5	13·66	5 0	71·07	..	..	15·00	4 0	..	51·67	..
„	14·33	6 15	..	90·41	..	11·50	2 0	..	33·70	..
„	..	..	..	..	..	13·00	7 0	..	..	103·88
6	14·16	11 15	..	..	152·52	10·50	2 0	..	..	36·75
11	13·83	10 0	..	..	138·81	9·50	2 0	41·14	..	..
12	14·67	10 0	..	141·31	..	13·50	3 0	..	43·06	..
„	..	..	..	..	..	11·50	2 0	..	33·70	..
„	..	..	..	..	..	12·67	7 15	..	..	110·39
13	14·00	6 15	86·68	..	..	10·50	2 0	..	..	36·75
„	13·00	4 0	..	..	59·07	..	..	..	..	..
14	..	..	..	..	..	9·50	2 0	..	40·79	..
15	..	..	..	..	..	11·50	2 0	33·98	..	..
16	..	..	..	..	..	11·50	2 0	..	..	33·55
18	14·50	9 15	..	..	122·47	..	..	..	..	..
19	15·16	9 45	..	133·32	..	13·50	5 0	..	71·76	..
„	..	..	..	..	..	14·67	5 0	..	..	65·75
20	14·67	6 0	79·42	..	..	..	..	..	..	..
„	14·34	4 0	..	..	53·55	..	..	..	..	..
25	14·16	9 45	..	..	132·19	..	..	..	..	..
26	15·00	9 45	..	134·75	..	14·50	5 0	..	66·81	..
„	..	..	..	..	..	15·00	5 0	..	..	64·31
27	15·34	6 0	75·95	..	..	..	..	..	..	..
„	14·67	4 0	..	..	52·34	..	..	..	..	..
Total -	(14·42)	114 0	313·12	499·79	745·01	(12·61)	59 15	116·26	341·49	451·33
Dec. 2	14·00	9 0	..	..	123·41	..	..	..	..	..
3	14·16	9 45	..	142·74	..	13·67	5 0	71·47	..	..
„	..	..	..	..	..	14·50	5 0	..	..	66·52
4	15·34	6 0	75·95	..	..	..	..	..	..	..
„	15·34	4 0	..	..	50·06	..	..	..	..	..
17	14·34	5 0	..	..	66·94	13·34	5 0	..	..	72·31
18	14·00	5 0	..	74·04	..	..	..	..	..	..
„	14·00	5 0	..	..	68·56	..	..	..	..	..
23	15·00	9 15	..	..	118·39	..	..	..	..	..
24	15·34	4 0	50·63	..	..	13·67	5 0	..	70·87	..
„	14·00	5 45	..	85·14	..	13·00	5 0	..	..	74·20
30	15·80	8 15	..	..	100·24	..	..	..	..	..
31	15·00	9 15	..	127·84	..	13·34	5 0	..	72·62	..
„	..	..	..	..	..	13·50	4 30	..	..	64·31
Total -	(14·66)	80 15	126·58	429·76	527·60	(13·56)	34 30	71·47	143·49	277·34

Table I.—*continued.*

Detailed Record of the Sewage applied to Permanent Grass Land. Second Season 1861–2.

Dates.	Five-acre Field.					Ten-acre Field.				
	Average Time taken to fill Gauge-tank (3·216 tons).	Time of application.	Sewage applied (calculated per acre). Plot 2. (Area ·99375 acre.)	Plot 3. (Area ·93081 acre.)	Plot 4. (Area 1·00512 acre.)	Average Time taken to fill Gauge-tank (3·216 tons).	Time of application.	Sewage applied (calculated per acre). Plot 2. (Area ·9875 acre.)	Plot 3. (Area ·99588 acre.)	Plot 4. (Area 1·00019 acre.)
	Mins.	H. M.	Tons.	Tons.	Tons.	Mins.	H. M.	Tons.	Tons.	Tons.
Jan. 1	15·00	3 30	45·31	..	..	..	..	..	..	..
6	15·16	9 45	..	..	123·47	..	..	..	..	..
7	15·16	9 45	..	133·32	..	12·00	4 45	77·35	..	..
„	..	..	..	..	..	12·00	5 0	..	..	80·38
8	15·00	5 45	74·43	..	..	..	..	..	..	..
„	15·34	4 0	..	..	50·06	..	..	..	..	..
13	14·50	9 45	..	..	129·09	..	..	..	..	..
14	14·67	9 45	..	137·78	..	12·00	5 0	..	80·73	..
„	..	..	..	..	..	12·34	5 0	..	..	78·17
15	14·34	6 0	81·24	..	..	..	..	..	..	..
„	15·34	4 0	..	..	50·06	..	..	..	..	..
21	21·25	5 45	..	56·09	..	..	..	..	..	..
22	16·34	5 0	59·42	..	..	..	..	..	..	..
„	16·00	5 0	..	..	59·99	..	..	..	..	..
27	15·83	9 45	..	..	118·24	..	..	..	..	..
28	15·50	9 45	..	130·40	..	12·34	5 0	..	78·51	..
„	..	..	..	..	..	12·50	5 0	..	..	77·17
29	15·50	5 0	62·64	..	..	..	..	..	..	..
„	14·67	4 0	..	..	52·34	..	..	..	..	..
Total -	(15·41)	103 30	323·04	457·59	583·25	(12·20)	29 45	77·35	159·24	235·72
Feb. 3	22·16	11 15	..	..	97·46	..	..	..	..	..
4	15·67	11 30	..	152·14	..	11·67	7 45	129·77	..	..
„	..	..	..	..	..	12·50	3 45	..	..	57·88
5	16·34	11 15	..	..	132·17	..	..	..	..	..
10	16·60	10 45	..	..	124·32	..	..	..	..	..
11	16·16	11 30	..	147·52	..	11·50	5 45	..	96·88	..
„	..	..	..	..	..	12·34	5 45	..	..	89·89
12	18·00	11 30	..	..	122·65	..	..	..	..	..
17	16·34	4 45	..	..	55·81	..	..	..	..	..
18	16·83	11 30	..	141·65	..	12·34	5 45	..	90·28	..
„	..	..	..	..	..	12·00	5 45	..	..	92·44
19	16·67	11 45	136·86	..	..	..	..	..	..	..
24	16·34	11 15	..	..	132·17	..	..	..	..	..
25	17·83	11 30	..	133·71	..	11·50	5 45	97·70	..	..
„	..	..	..	..	..	12·34	5 45	..	..	89·89
26	18·00	3 0	32·36	..	..	..	..	..	..	..
„	16·00	7 15	..	..	86·99	..	..	..	..	..
Total -	(17·03)	128 45	169·22	575·02	751·57	(11·98)	46 0	227·47	187·16	330·10
Mar. 3	16·00	11 15	..	..	134·98	..	..	..	..	..
4	18·00	11 30	..	132·44	..	12·00	5 45	..	92·84	..
„	..	..	..	..	..	11·34	5 45	..	..	97·82
5	16·34	6 45	80·21	..	..	..	..	..	..	..
„	17·34	3 45	..	..	41·52	..	..	..	..	..
17	(8 tanks*)	11 0	..	..	25·60	..	..	..	..	..
21	16·00	11 30	..	149·00	..	12·00	5 45	..	92·84	..
„	..	..	..	..	..	11·33	5 45	..	..	97·82
22	14·50	4 15	56·91	..	..	..	..	..	..	..
„	13·67	5 45	..	..	80·75	..	..	..	..	..
24	..	..	..	..	..	12·00	4 45	..	..	76·37
25	..	..	..	..	..	11·83	11 30	..	188·35	..
26	..	..	..	..	..	12·00	6 45	109·91	..	..
„	..	..	..	..	..	11·67	4 15	..	..	70·26
27	14·67	11 0	..	..	143·95	..	..	..	..	..
28	13·67	11 30	..	174·40	..	..	..	..	..	..
29	13·33	6 45	93·32	..	..	..	..	..	..	..
„	14·00	3 45	..	..	51·42	..	..	..	..	..
31	..	..	..	..	..	12·16	11·30	..	..	182·45
Total -	(16·73)	98 45	235·44	455·84	478·22	(11·85)	61 45	109·91	374·03	524·72

* When the *number of tanks* is given, the flow was too slow and irregular to estimate it by the average time taken to fill the gauge-tank, and therefore the actual number of tankfuls was counted.

Table I.—*continued.*

Detailed Record of the Sewage applied to Permanent Grass Land.
Second Season 1861–2.

Dates.	Five-acre Field.					Ten-acre Field.				
	Average Time taken to fill Gauge-tank (3·216 tons).	Time of application.	Sewage applied (calculated per acre). Plot 2. (Area ·99375 acre.)	Plot 3. (Area ·93081 acre.)	Plot 4. (Area 1·00512 acre.)	Average Time taken to fill Gauge-tank (3·216 tons).	Time of application.	Sewage applied (calculated per acre). Plot 2. (Area ·9875 acre.)	Plot 3. (Area ·99588 acre.)	Plot 2. (Area 1·00019 acre.)
	Mins.	H. M.	Tons.	Tons.	Tons.	Mins.	H. M.	Tons.	Tons.	Tons.
April 1	..	..	..	..	..	11·50	11 30	..	193·76	..
2	..	..	..	..	..	12·33	6 45	106·97	..	..
„	..	..	..	..	..	11·33	4 15	..	..	72·37
3	15·16	11 30	..	..	145·63	..	..	..	..	..
4	15·50	11 30	..	153·80	..	..	..	..	..	..
5	15·67	6 45	83·64	..	..	..	..	..	..	..
„	15·00	2 45	..	..	35·20	..	..	..	..	..
7	..	..	..	..	..	11·80	10 15	..	..	167·58
8	..	..	..	..	..	12·16	11 30	..	183·24	..
9	..	..	..	..	..	12·33	5 45	91·12	..	..
„	..	..	..	..	..	11·50	3 45	..	..	62·91
10	15·20	10 15	..	..	129·46	..	..	..	..	..
11	14·75	7 45	..	108·92	..	..	..	..	..	..
12	15·67	10 15	..	..	125·58	..	..	..	..	..
14	..	..	..	..	..	12·33	10 30	..	..	164·29
15	..	..	..	..	..	12·33	11 30	..	180·71	..
16	..	..	..	..	..	12·33	6 45	106·97	..	..
„	..	..	..	..	..	11·67	4 30	..	..	74·39
17	17·60	10 0	..	..	109·08	..	..	..	..	..
19	15·67	4 0	49·56	..	..	..	..	..	..	..
„	15·33	6 45	..	91·28	..	..	..	..	..	..
21	..	..	..	..	..	12·16	10 30	..	..	166·59
22	..	..	..	..	..	12·33	11 30	..	180·71	..
23	..	..	..	..	..	12·33	6 45	106·97	..	..
„	..	..	..	..	..	11·50	3 30	..	..	58·71
24	16·00	11 0	..	..	131·98	..	..	..	..	..
25	16·00	11 30	..	149·00	..	..	..	..	..	..
26	16·67	6 45	78·62	..	..	..	..	..	..	..
„	16·67	3 45	..	..	43·19	..	..	..	..	..
28	..	..	..	..	..	12·67	4 45	..	..	72·33
29	..	..	..	..	..	13·50	11 30	..	165·05	..
30	..	..	..	..	..	13·67	6 45	96·49	..	..
„	..	..	..	..	..	13·00	2 30	..	..	37·10
Total -	(15·75)	114 30	211·82	503·00	720·12	(12·26)	144 45	508·52	903·47	876·27
May 1	17·67	4 45	..	..	51·61	..	..	..	..	..
2	20·67	4 45	44·62	..	..	..	..	..	..	..
„	21·00	6 45	..	66·63	..	..	..	..	..	..
3	20·67	10 30	..	..	97·52	..	..	..	..	..
5	..	..	..	..	..	13·16	10 30	..	..	153·93
6	..	..	..	..	..	13·50	4 30	..	64·59	..
„	..	..	..	..	..	13·67	5 45	..	..	81·15
7	..	..	..	..	..	13·33	5 45	84·29	..	..
„	..	..	..	..	..	13·33	5 0	..	..	72·36
8	25·67	11 30	..	..	86·00	..	..	..	..	..
9	25·67	11 30	..	92·87	..	..	..	..	..	..
10	25·00	6 15	48·54	..	..	..	..	..	..	..
„	23·33	4 15	..	..	34·97	..	..	..	..	..
12	..	..	..	..	..	15·40	8 45	..	..	109·62
13	..	..	..	..	..	14·67	5 45	..	75·94	..
„	..	..	..	..	..	17·00	6 0	..	..	68·09
14	..	..	..	..	..	16·00	4 45	58·01	..	..
„	..	..	..	..	..	12·67	6 45	..	..	102·78
15	24·50	11 30	..	..	90·11	..	..	..	..	..
16	16·00	11 30	..	149·00	..	..	..	..	..	..
17	15·50	4 0	50·11	..	..	..	..	..	..	..
„	16·00	6 45	..	..	80·99	..	..	..	..	..
19	..	..	..	..	..	11·83	10 30	..	..	171·23
20	..	..	..	..	..	12·67	5 45	..	87·93	..
„	..	..	..	..	..	13·33	5 45	..	..	83·22
21	..	..	..	..	..	11·50	3 0	50·97	..	..
„	..	..	..	..	..	12·33	5 45	..	..	89·97
22	19·00	11 30	..	..	116·20	..	..	..	..	..
23	16·83	11 30	..	141·65	..	..	..	..	..	..
24	17·00	5 45	65·68	..	..	..	..	..	..	..
„	17·00	4 45	..	..	53·64	..	..	..	..	..
26	..	..	..	..	..	11·83	10 30	..	..	171·23
27	..	..	..	..	..	11·33	11 30	..	196·67	..
28	..	..	..	..	..	11·67	5 45	96·28	..	..
„	..	..	..	..	..	11·33	5 45	..	..	97·91
29	20·00	11 30	..	..	110·39	..	..	..	..	..
30	18·17	11 30	..	131·20	..	..	..	..	..	..
31	18·00	6 45	72·82	..	..	..	..	..	..	..
„	17·33	3 45	..	..	41·54	..	..	..	..	..
Total -	(19·56)	161 0	281·77	581·35	762·97	(12·90)	127 45	289·55	425·13	1201·49

Table I.—*continued.*

Detailed Record of the Sewage applied to Permanent Grass Land.
Second Season 1861–2.

Dates.	Five-acre Field.					Ten-acre Field.				
	Average time taken to fill Gauge-tank (3·216 tons).	Time of application.	Sewage applied (calculated per acre). Plot 2. (Area ·99375 acre.)	Plot 3. (Area ·93081 acre.)	Plot 4. (Area 1·00512 acre.)	Average time taken to fill Gauge-tank (3·216 tons).	Time of application.	Sewage applied (calculated per acre). Plot 2. (Area ·9875 acre.)	Plot 3. (Area ·99588 acre.)	Plot 4. (Area 1·00019 acre.)
	Mins.	H. M.	Tons.	Tons.	Tons.	Mins.	H. M.	Tons.	Tons.	Tons.
June 2	..	..	..	..	..	13·00	4 45	..	..	70·49
3	..	..	..	..	..	12·00	7 45	..	125·14	..
,,	..	..	..	..	..	12·00	3 45	..	..	60·29
4	..	..	..	..	..	13·33	5 45	84·29	..	..
,,	..	..	..	..	..	13·00	5 45	..	..	85·33
5	18·80	11 30	..	..	117·43	..	..	..	..	..
6	16·83	11 30	..	141·65	..	..	..	..	..	..
7	17·00	6 45	77·10	..	..	..	..	..	..	..
,,	16·33	3 45	..	..	44·09	..	..	..	..	..
9	..	..	..	..	..	10·50	4 0	..	73·81	..
,,	..	..	..	..	..	12·00	6 45	..	..	108·52
10	..	..	..	..	..	14·00	9 15	..	128·02	..
11	..	..	..	..	..	12·67	5 45	88·68	..	..
,,	..	..	..	..	..	13·00	5 45	..	..	85·33
12	16·83	11 30	..	..	131·18	..	..	..	..	..
13	18·00	2 0	..	23·03	..	..	..	..	..	..
Total -	(17·30)	47 0	77·10	164·68	292·70	(12·61)	59 15	172·97	326·97	409·96
July 5	36·50	4 0	..	..	21·04	17·75	7 0	..	..	76·08
7	..	..	..	..	..	14·00	11 0	..	..	151·58
8	..	..	..	..	..	11·33	11 0	..	188·11	..
9	..	..	..	..	..	11·17	12 0	209·92	..	..
10	16·00	12 0	..	..	143·98	12·00	12 0	..	..	102·92
11	16·50	12 0	..	150·77	..	12·00	12 0	..	193·76	..
12	15·67	11 0	136·30	..	..	11·83	11 0	..	..	179·39
14	15·67	11 0	..	..	134·76	11·67	11 0	..	..	181·85
15	15·50	12 0	..	160·49	..	11·67	12 0	..	199·24	..
16	15·50	12 0	150·33	..	..	12·33	12 0	190·17	..	..
17	16·16	12 0	..	..	142·56	13·50	12 0	..	..	171·49
18	15·60	11 0	..	146·17	..	11·60	11 0	..	183·74	..
19	15·33	11 0	..	..	137·75	11·67	11 0	..	..	181·85
21	14·83	11 0	..	..	142·40	11·67	11 0	..	..	181·85
22	15·50	4 45	..	63·53	..	11·00	4 45	..	83·67	..
23	16·33	12 0	142·69	..	..	11·33	12 0	..	205·22	..
24	15·50	12 0	..	..	148·63	12·00	12 0	195·40	..	..
25	15·50	12 0	..	160·49	..	11·50	12 0	..	..	201·31
26	14·17	11 0	150·73	..	..	12 50	5 0	..	..	77·17
28	15·33	11 0	..	..	137·75	12·00	2 0	..	..	32·15
29	15·00	11 30	..	158·93	..	11·60	12 0	..	..	199·58
30	14·67	12 0	..	..	157·04	11·50	12 0	..	202·18	..
31	14·60	12 0	..	..	157·79	12·20	12 0	..	..	189·76
Total -	(15·59)	217 15	580·05	840·38	1323·70	(12·00)	239 45	595·49	1255·92	2016·98
Aug. 1	14·67	12 0	..	..	157·04	11·40	12 0	..	203·96	..
2	14·67	11 0	..	..	143·95	11·25	11 0	..	..	188·64
4	14·67	11 0	..	..	143·95	11·60	11 0	..	..	182·04
5	14·67	12 0	..	..	157·04	11·00	12 0	..	200·44	..
6	15·33	12 0	151·99	..	..	11·60	12 0	..	..	199·58
7	15·00	12 0	..	..	153·58	11·60	12 0	202·14	..	..
8	15·17	12 0	..	..	151·86	11·60	12 0	..	200·44	..
9	15·33	11 0	..	148·75	..	11·80	11 0	..	..	179·84
11	..	..	..	..	..	11·00	5 0	..	..	87·69
12	..	..	..	..	..	12·00	12 0	..	193·76	..
13	..	..	..	..	..	11·60	11 30	..	..	191·26
14	15·33	12 0	..	..	150·28	..	..	..	..	..
15	15·33	12 0	..	162·27	..	..	..	..	..	..
16	15·00	7 30	..	..	95·99	..	..	..	..	..
18	..	..	..	..	..	12·40	11 0	..	..	171·14
19	..	..	..	..	..	11·50	12 0	..	202·18	..
20	15·00	12 0	..	..	153·58	..	..	..	..	..
21	15·00	12 0	..	165·84	..	..	..	..	..	..
25	15·67	11 0	..	..	134·76	11·50	11 0	..	..	184·53
26	14·83	12 0	157·12	..	..	12·00	12 0	195·40	..	..
Total -	(15·04)	171 30	309·11	476·86	1442·03	(11·65)	167 30	397·54	1000·78	1385·62

Table I.—*continued.*

Detailed Record of the Sewage applied to Permanent Grass Land.
Second Season 1861–2.

Dates.	Five-acre Field.					Ten-acre Field.				
	Average time taken to fill Gauge-tank (3·216 tons).	Time of application.	Sewage applied (calculated per acre).			Average time taken to fill Gauge-tank (3·216 tons).	Time of application.	Sewage applied (calculated per acre).		
			Plot 2. (Area ·99375 acre.)	Plot 3. (Area ·93081 acre.)	Plot 4. (Area 1·00512 acre.)			Plot 2. (Area ·9875 acre.)	Plot 3. (Area ·99588 acre.)	Plot 4. (Area 1·00019 acre.)
	Mins.	H. M.	Tons.	Tons.	Tons.	Mins.	H. M.	Tons.	Tons.	Tons.
Sept. 1	14·83	11 0	..	..	142·40	11·50	11 0	..	..	184·53
2	14·83	12 0	..	167·74	..	11·33	12 0	..	205·22	..
8	15·50	11 0	..	..	136·24	..	..	..	..	..
9	15·33	12 0	..	162·27	..	..	..	..	..	..
15	15·67	11 0	..	..	134·76	11·67	11 0	..	..	181·85
16	14·67	6 0	79·42	..	..	12·17	12 0	..	191·05	..
„	15·00	6 0	..	82·92	..	..	..	..	..	..
22	17·00	3 0	..	..	33·88	12·50	3 0	..	..	46·30
23	16·33	6 0	..	76·17	..	13·20	12 0	177·64	..	..
„	18·33	6 0	..	..	62·84	..	..	..	..	..
29	17·83	11 0	..	..	118·44	12·20	11 0	..	..	173·95
30	18·50	12 0	..	134·47	..	12·17	12 0	..	..	190·23
Total -	(15·99)	107 0	79·42	623·57	628·56	(12·03)	84 0	177·64	396·27	776·86
Oct. 6	24·60	11 0	..	..	85·84	23·40	11 0	..	..	90·69
7	28·67	12 0	..	86·77	..	26·20	12 0	..	88·74	..
13	16·00	11 0	..	..	131·98	11·50	11 0	..	..	184·54
14	16·00	6 0	72·82	..	..	11·16	12 0	..	208·34	..
„	16·33	6 0	..	76·17	..	..	..	..	..	..
20	..	..	..	..	..	12·33	11 0	..	..	172·11
21	..	..	..	..	..	12·67	11 0	..	168·22	..
22	..	..	..	..	..	12·50	11 0	171·95	..	..
23	15·33	11 0	..	..	137·75	..	..	..	..	..
24	15·25	8 0	..	108·75	..	..	..	..	..	..
25	16·00	11 0	..	..	131·98	..	..	..	..	..
27	..	..	..	..	..	12·33	5 15	83·20	..	..
„	..	..	..	..	..	12·00	1 15	..	20·18	..
„	..	..	..	..	..	12·33	4 30	..	..	70·41
28	16·00	11 0	..	..	131·98	..	..	..	..	..
29	16·25	9 0	..	114·81	..	..	..	..	..	..
„	16·50	3 0	..	..	34·90	..	..	..	..	..
30	16·00	12 0	145·63	..	..	..	..	..	..	..
31	16·00	5 30	66·75	..	..	..	..	..	..	..
„	16·33	6 30	..	..	76·42	..	..	..	..	..
Total -	(17·23)	123 0	285·20	386·50	730·85	(13·86)	90 0	255·15	485·48	517·75

Table II.

Detailed Record of the Sewage applied to Permanent Grass Land. Third Season 1862–3.

Dates.	Five-acre Field.					Ten-acre Field.				
	Average time taken to fill Gauge-tank (3·216 tons).	Time of application.	Sewage applied (calculated per acre). Plot 2. (Area ·99375 acre.)	Plot 3. (Area ·93081 acre.)	Plot 4. (Area 1·00512 acre.)	Average time taken to fill Gauge-tank (3·216 tons).	Time of application.	Sewage applied (calculated per acre). Plot 2. (Area ·9875 acre.)	Plot 3. (Area ·99588 acre.)	Plot 4. (Area 1·00019 acre.)
	Mins.	H. M.	Tons.	Tons.	Tons.	Mins.	H. M.	Tons.	Tons.	Tons.
Nov. 1	17·00	11 0	..	..	124·22	..	..	..	..	..
3	..	..	..	..	..	12·67	4 0	..	..	60·91
4	..	..	..	..	..	12·50	10 0	..	155·01	..
5	..	..	..	..	..	12·83	10 0	..	..	150·37
6	16·67	10 0	..	..	115·16	..	..	..	..	..
7	16·33	10 0	..	126·95	..	..	..	..	..	..
8	15·83	10 0	..	..	121·27	..	..	..	..	..
10	..	..	..	..	..	13·50	10 0	..	..	142·91
11	..	..	..	..	..	12·67	10 0	..	152·93	..
12	..	..	..	..	..	13·00	10 0	150·31	..	..
13	16·83	10 0	..	..	114·07	..	..	..	..	..
14	16·00	10 0	..	129·56	..	..	..	..	..	..
15	16·25	7 30	89·62	..	..	..	..	..	..	..
17	..	..	..	..	..	12·60	9 30	..	..	145·46
18	..	..	..	..	..	13·00	10 0	..	149·05	..
19	..	..	..	..	..	12·50	10 0	..	..	154·34
20	17·00	10 0	..	..	112·93	..	..	..	..	..
21	16·33	10 0	..	126·95	..	..	..	..	..	..
22	15·40	9 0	..	..	112·19	..	..	..	..	..
24	..	..	..	..	..	12·33	7 30	..	..	117·35
25	..	..	..	..	..	12·40	9 0	..	140·63	..
26	..	..	..	..	..	12·40	8 45	137·88	..	..
27	16·60	9 15	..	..	106·98	..	..	..	..	..
28	16·00	10 0	..	129·56	..	..	..	..	..	..
29	16·00	9 15	112·26	..	..	..	..	..	..	..
Total -	(16·33)	126 0	201·88	513·02	806·82	(12·71)	108 45	288·19	597·62	771·34
Dec. 1	..	..	..	..	..	12·50	10 0	..	..	154·34
2	..	..	..	..	..	12·50	10 0	..	155·01	..
3	..	..	..	..	..	12·40	9 0	..	..	140·03
4	16·67	10 0	..	..	115·16	..	..	..	..	..
5	16·50	10 0	..	125·64	..	..	..	..	..	..
6	16·67	10 0	..	..	115·16	..	..	..	..	..
9	..	..	..	..	..	12·40	8 0	..	..	124·47
10	..	..	..	..	..	12·40	9 0	..	140·63	..
11	18·00	6 0	..	..	63·99	..	..	..	..	..
12	17·00	6 45	..	82·31	..	..	..	..	..	..
13	17·00	10 0	114·22	..	..	..	..	..	..	..
15	..	..	..	..	..	12·00	10 0	..	..	160·77
16	..	..	..	..	..	11·67	10 0	..	166·03	..
17	..	..	..	..	..	11·60	9 0	151·61	..	..
18	17·00	10 0	..	..	112·93	..	..	..	..	..
19	19·33	10 0	..	107·24	..	..	..	..	..	..
20	18·60	9 0	..	..	92·89	..	..	..	..	..
22	..	..	..	..	..	11·67	10 0	..	..	165·32
23	..	..	..	..	..	11·83	10 0	..	163·79	..
24	..	..	..	..	..	11·60	9 0	..	..	149·68
Total -	(17·34)	81 45	114·22	315·19	500·13	(12·04)	104 0	151·61	625·46	894·61
Jan. 5	..	..	..	..	..	11·67	10 0	..	..	165·32
6	..	..	..	..	..	12·00	10 0	162·84	..	..
7	..	..	..	..	..	11·40	9 0	..	..	152·31
8	17·33	10 0	112·04	..	..	..	..	..	..	..
9	16·33	10 0	..	..	117·56	..	..	..	..	..
10	16·67	10 0	116·48	..	..	..	..	..	..	..
12	..	..	..	..	..	11·83	10 0	..	..	163·08
13	..	..	..	..	..	11·67	10 0	..	166·03	..
14	..	..	..	..	..	11·67	10 0	..	..	165·32
15	17·83	10 0	..	..	107·67	..	..	..	..	..
16	16·80	9 0	..	111·06	..	..	..	..	..	..
17	16·17	10 0	..	..	118·72	..	..	..	..	..
19	..	..	..	..	..	12·00	2 30	..	..	40·19
20	..	..	..	..	..	12·00	10 0	..	161·47	..
21	..	..	..	..	..	11·83	10 0	165·18	..	..
22	16·33	10 0	..	..	117·56	..	..	..	..	..
23	16·00	10 0	..	129·56	..	..	..	..	..	..
24	15·83	10 0	122·66	..	..	..	..	..	..	..
26	..	..	..	..	..	11·83	10 0	..	..	163·08
27	..	..	..	..	..	12·50	7 0	..	108·50	..
28	..	..	..	..	..	11·30	10 0	165·60	..	..
29	16·67	10 0	..	124·36	..	..	..	..	..	..
30	16·17	10 0	..	..	118·72	..	..	..	..	..
31	16·67	10 0	..	124·36	..	..	..	..	..	..
Total	(16·55)	119 0	351·18	489·34	580·23	(11·82)	108 30	493·62	436·00	819·30

Table II.—*continued.*

Detailed Record of the Sewage applied to Permanent Grass Land.
Third Season 1862–3.

Dates.	Five-acre Field.					Ten-acre Field.				
	Average time taken to fill Gauge-tank (3·216 tons).	Time of application.	Sewage applied (calculated per acre). Plot 2. (Area ·99375 acre.)	Plot 3. (Area ·93081 acre.)	Plot 4. (Area 1·00512 acre.)	Average time taken to fill Gauge-tank (3·216 tons).	Time of application.	Sewage applied (calculated per acre). Plot 2. (Area ·9875 acre.)	Plot 3. (Area ·99558 acre.)	Plot 4. (Area 1·00019 acre.)
	Mins.	H. M.	Tons.	Tons.	Tons.	Mins.	H. M.	Tons.	Tons.	Tons.
Feb. 2	..	..	..	..	..	12·00	7 15	..	..	116·56
3	..	..	..	..	..	11·67	10 0	..	166·03	..
4	..	..	..	..	..	11·83	10 0	..	..	163·08
5	20·50	10 0	..	..	93·65	..	..	..	..	..
6	22·33	10 0	..	92·84	..	..	..	..	..	..
7	23·00	9 0	..	..	75·12	..	..	..	..	..
9	..	..	..	..	..	11·60	11 0	..	..	182·94
10	..	..	..	..	..	11·67	11 0	..	182·63	..
11	..	..	..	..	..	11·67	11 0	..	..	181·85
12	26·00	11 0	..	..	81·22	..	..	..	..	..
13	26·50	11 0	..	86·05	..	..	..	..	..	..
14	26·50	10 0	73·27	..	..	..	..	..	..	..
16	..	..	..	..	..	11·67	11 0	..	..	181·85
17	..	..	..	..	..	11·50	12 0	..	202·18	..
18	..	..	..	..	..	11·67	12 0	209·93	..	..
19	29·00	12 0	..	..	79·44	..	..	..	..	..
20	27·67	12 0	..	89·90	..	..	..	..	..	..
21	26·17	11 0	..	..	80·69	..	..	..	..	..
23	..	..	..	..	..	11·33	11 0	..	..	187·30
24	20·50	12 0	..	..	112·38	..	..	..	..	..
25	17·67	12 0	..	140·78	..	..	..	..	..	..
26	16·80	10 30	121·36	..	..	..	..	..	..	..
27	17·33	12 0	..	..	132·93	..	..	..	..	..
28	16·17	11 0	..	141·02	..	..	..	..	..	..
Total -	(21·70)	153 30	194·63	550·59	655·43	(11·64)	106 15	209·93	550·84	1013·58
Mar. 2	16·67	11 0	..	..	126·68	..	..	..	..	..
3	..	..	..	..	..	11·50	12 0	..	202·18	..
4	15·67	12 0	..	..	147·02	..	..	..	..	..
5	15·60	9 0	..	119·60	..	..	..	..	..	..
6	15·83	12 0	147·19	..	..	..	..	..	..	..
7	15·17	11 0	..	..	139·20	..	..	..	..	..
9	15·50	3 0	..	..	37·16	..	..	..	..	..
11	20·83	12 0	..	119·43	..	..	..	..	..	..
12	14·33	7 0	..	..	93·78	..	..	..	..	..
13	..	..	..	..	..	11·50	12 0	..	..	201·31
14	15·00	11 0	..	..	140·78	..	..	..	..	..
16	14·17	11 0	..	..	149·03	..	..	..	..	..
17	..	..	..	..	..	11·50	12 0	203·90	..	..
18	14·00	12 0	..	177·69	..	..	..	..	..	..
19	13·33	12 0	174·80	..	..	..	..	..	..	..
20	13·50	12 0	..	..	170·65	..	..	..	..	..
21	13·33	11 0	..	171·07	..	..	..	..	..	..
23	13·17	11 0	..	..	160·35	..	..	..	..	..
24	..	..	..	..	..	11·83	12 0	..	..	195·70
25	13·33	12 0	..	186·62	..	..	..	..	..	..
27	14·50	12 0	160·70	..	..	..	..	..	..	..
28	13·67	10 30	..	..	147·46	..	..	..	..	..
30	33·17	11 0	..	..	63·66	..	..	..	..	..
31	..	..	..	..	..	12·33	12 0	..	188·57	..
Total -	(15·13)	202 30	482·69	774·41	1375·77	(11·72)	60 0	203·90	390·75	397·01
April 1	15·83	12 0	..	157·15	..	..	..	..	..	..
2	15·50	12 0	..	..	148·63	..	..	..	..	..
6	16·33	11 0	..	..	129·32	..	..	..	..	..
7	..	..	..	..	..	11·67	12 0	..	..	198·38
8	16·17	12 0	..	153·84	..	..	..	..	..	..
9	16·67	12 0	139·78	..	..	..	..	..	..	..
16	..	..	..	..	..	11·67	12 0	..	199·24	..
17	..	..	..	..	..	11·83	12 0	..	..	195·70
20	17·83	11 0	..	..	118·44	..	..	..	..	..
21	17·40	10 30	..	125·10	..	..	..	..	..	..
22	17·17	12 0	..	..	134·17	..	..	..	..	..
23	..	..	..	..	..	11·50	12 0	203·90	..	..
24	..	..	..	..	..	11·67	12 0	..	..	198·38
27	18·33	10 30	..	..	109·97	..	..	..	..	..
28	21·67	12 0	..	114·80	..	..	..	..	..	..
29	24·67	12 0	94·45	..	..	..	..	..	..	..
30	..	..	..	..	..	11·83	12 0	..	196·54	..
Total -	(17·64)	127 0	234·23	550·89	640·53	(11·69)	72 0	203·90	395·78	592·46

Table II.—*continued.*

Detailed Record of the Sewage applied to Permanent Grass Land. Third Season 1862–3.

Dates.	Five-acre Field.					Ten-acre Field.				
	Average time taken to fill Gauge-tank (3·216 tons).	Time of application.	Sewage applied (calculated per acre). Plot 2. (Area ·99375 acre.)	Plot 3. (Area ·98081 acre.)	Plot 4. (Area 1·00512 acre.)	Average time taken to fill Gauge-tank (3·216 tons).	Time of application.	Sewage applied (calculated per acre). Plot 2. (Area ·9875 acre.)	Plot 3. (Area ·99588 acre.)	Plot 4. (Area 1·00019 acre.)
	Mins.	H. M.	Tons.	Tons.	Tons.	Mins.	H. M.	Tons.	Tons.	Tons.
May 1	..	..	..	..	..	11·83	12 0	..	..	195·70
4	28·80	10 30	..	..	69·99	..	..	..	..	..
5	28·83	11 15	..	80·89	..	..	..	..	..	..
6	27·67	12 0	..	..	83·26	..	..	..	..	..
7	..	..	..	..	..	11·67	12 0	..	..	198·38
8	..	..	..	..	..	11·67	12 0	..	199·24	..
12	35·33	11 15	..	..	61·13	..	..	..	..	..
13	24·17	11 15	90·38	..	..	..	..	..	..	..
14	..	..	..	..	..	11·80	9 30	..	..	155·32
15	..	..	..	..	..	13·50	2 45	39·81	..	..
18	16·67	5 0	..	62·18	..	..	..	..	..	..
19	16·50	12 0	..	..	139·62	..	..	..	..	..
20	16·33	12 0	..	152·34	..	..	..	..	..	..
27	16·33	5 0	..	..	58·78	..	..	..	..	..
28	16·67	12 0	..	149·23	..	11·33	12 0	..	205·22	..
29	16·17	12 0	..	..	142·47	12·00	12 0	..	..	192·92
30	16·17	10 30	..	134·61	..	11·40	10 30	..	178·46	..
Total -	(20·28)	124 45	90·38	579·25	555·25	(11·72)	82 45	39·81	582·92	742·32
June 1	16 00	11 0	..	..	131·98	12·00	11 0	..	177·61	..
2	16·50	12 0	..	150·77	..	11·83	12 0	..	..	195·70
3	20·00	12 0	..	..	115·19	11·67	12 0	..	199·24	..
4	21·17	12 0	110·07	..	..	11·67	12 0	..	..	198·38
5	23·00	12 0	..	..	100·16	11·50	12 0	..	202·18	..
6	17·20	10 30	118·54	..	..	12·17	10 30	..	..	166·45
8	16·25	9 45	..	..	115·19	..	..	..	..	..
9	17·80	12 0	..	139·76	..	..	..	..	..	..
10	15·50	12 0	150·33	..	..	..	..	..	..	..
11	..	..	..	..	..	11·83	12 0	..	196·54	..
12	..	..	..	..	..	12·00	12 0	..	..	192·92
15	17·00	9 45	111·36	..	..	..	..	..	..	..
16	16·83	12 0	..	147·81	..	..	..	..	..	..
17	17·00	12 0	137·06	..	..	..	..	..	..	..
18	..	..	..	..	..	11·67	12 0	..	199·24	..
19	..	..	..	..	..	11·83	11 30	189·95	..	..
22	16·00	11 0	133·49	..	..	..	..	..	..	..
23	15·67	7 45	..	102·53	..	..	..	..	..	..
24	17·17	12 0	135·71	..	..	..	..	..	..	..
25	..	..	..	..	..	12·00	12 0	195·40	..	..
26	..	..	..	..	..	11·83	12 0	..	..	195·70
Total -	(17·41)	167 45	896·56	540·87	462·52	(11·83)	141 0	385·35	974·81	949·15
July 1	19·17	12 0	..	..	120·17	..	..	..	..	..
2	..	..	..	..	..	12·00	12 0	..	..	192·92
3	..	..	..	..	..	12·20	11 0	176·18	..	..
6	17·67	10 30	..	..	114·08	..	..	..	..	..
7	..	..	..	..	..	12·33	11 30	182·25	..	..
8	17·17	11 30	..	..	128·58	..	..	..	..	..
9	..	..	..	..	..	11·75	8 45	..	..	143·67
10	16·40	9 45	..	..	114·13	..	..	..	..	..
13	17·67	10 30	..	..	114·08	..	..	..	..	..
14	17·33	11 30	..	137·56	..	..	..	..	..	..
15	18·00	9 0	..	..	95·99	..	..	..	..	..
16	..	..	..	..	..	11·25	8 0	..	..	137·19
17	..	..	..	..	..	12·25	8 0	..	..	125·99
20	16·17	11 0	..	141·02	..	..	..	..	..	..
21	17·80	9 15	100·90	..	..	..	..	..	..	..
22	16·83	12 0	..	147·81	..	..	..	..	..	..
23	..	..	..	..	..	12·33	12 0	..	188·57	..
24	..	..	..	..	..	11·80	11 0	..	..	179·84
27	17·50	10 15	..	..	112·44	..	..	..	..	..
28	17·80	10 30	..	..	113·25	..	..	..	..	..
29	17·67	6 15	..	..	67·90	..	..	..	..	..
30	..	..	..	..	..	12·40	10 0	..	156·26	..
31	..	..	..	..	..	11·67	8 0	133·95	..	..
Total -	(17·44)	134 0	100·90	426·39	980·62	(12·02)	100 15	492·38	344·83	779·61

Table II.—*continued.*

Detailed Record of the Sewage applied to Permanent Grass Land.
Third Season 1862–3.

Dates.	Five-acre Field.					Ten-acre Field.				
	Average time taken to fill Gauge-tank (3·216 tons).	Time of application.	Sewage applied (calculated per acre). Plot 2. (Area ·99875 acre.)	Plot 3. (Area ·93081 acre.)	Plot 4. (Area 1·00512 acre.)	Average time taken to fill Gauge-tank (3·216 tons).	Time of application.	Sewage applied (calculated per acre). Plot 2. (Area ·9875 acre.)	Plot 3. (Acre ·99588 acre.)	Plot 4. (Area 1·00019 acre.)
	Mins.	H. M.	Tons.	Tons.	Tons.	Mins.	H. M.	Tons.	Tons.	Tons.
Aug. 3	16·00	2 30	..	..	30·00	..	..	..	..	..
4	16·00	12 0	..	..	143·98	..	..	..	..	..
5	17·17	12 0	..	144·88	..	..	..	..	..	..
6	..	..	..	..	..	13·00	12 0	..	..	178·08
7	..	..	..	..	..	14·00	10 45	150·04	..	..
10	16·00	10 0	..	..	119·99	..	..	..	..	..
11	17·33	12 0	..	143·55	..	..	..	..	..	..
12	19·67	7 0	..	..	68·32	..	..	..	..	..
17	16·33	11 0	..	..	129·32	..	..	..	..	..
18	18·40	10 45	..	121·12	..	..	..	..	..	..
19	23·00	1 30	..	..	12·52	..	..	..	..	..
20	..	..	..	..	..	12·33	11 0	..	..	172·11
21	..	..	..	..	..	12·40	11 0	..	..	171·14
24	15·40	10 0	..	..	124·66	..	..	..	..	..
25	15·50	8 0	..	..	99·09	..	..	..	..	..
26	18·50	12 0	..	..	124·53	..	..	..	..	..
27	..	..	..	..	..	11·83	12 0	..	..	195·70
31	17·60	10 15	..	..	111·81	..	..	..	..	..
Total -	(17·00)	119 0	..	409·55	964·22	(12·65)	56 45	150·04	..	717·03
Sept. 1	15·83	12 0	..	157·15	..	..	..	..	..	..
2	18·33	12 0	..	..	125·68	..	..	..	..	..
3	..	..	..	..	..	13·40	10 15	..	..	147·57
4	..	..	..	..	..	12·50	12 0	..	186·01	..
7	17·50	11 0	..	..	120·67	..	..	..	..	..
8	16·50	11 30	..	144·48	..	..	..	..	..	..
9	17·00	12 0	..	..	135·51	..	..	..	..	..
10	..	..	..	..	..	12·00	9 0	..	145·32	..
11	..	..	..	..	..	13·50	7 0	..	..	100·03
15	16·00	12 0	145·63	..	..	..	..	..	..	..
16	16·75	8 15	..	102·11	..	..	..	..	..	..
17	..	..	..	..	..	13·00	7 30	..	..	111·30
18	..	..	..	..	..	12·80	9 15	..	140·02	..
21	19·00	11 0	..	..	111·15	..	..	..	..	..
22	17·40	10 30	..	125·10	..	..	..	..	..	..
23	18·75	8 0	..	88·45	..	..	..	..	..	..
24	..	..	..	..	..	12·75	9 0	..	..	136·18
25	..	..	..	..	..	12·00	10 30	..	169·54	..
28	17·83	11 0	..	..	118·44	..	..	..	..	..
29	18·00	12 0	129·45	..	..	..	..	..	..	..
30	19·67	5 0	..	..	48·80	..	..	..	..	..
Total -	(17·39)	136 15	275·08	617·29	660·25	(12·68)	74 30	..	640·89	495·08
Oct. 1	..	..	..	..	..	12·33	12 0	..	..	187·76
2	..	..	..	..	..	13·50	8 0	115·79	..	..
5	16·50	6 30	..	81·67	..	..	..	..	..	..
„	16·50	4 30	..	..	52·36	..	..	..	..	..
6	18·00	9 30	..	..	101·32	..	..	..	..	..
7	19·25	8 45	..	..	87·26	..	..	..	..	..
8	..	..	..	..	..	11·80	10 30	..	..	171·67
9	..	..	..	..	..	12·33	12 0	..	188·57	..
12	17·67	11 0	..	..	119·51	..	..	..	..	..
13	16·83	12 0	..	..	136·88	..	..	..	..	..
14	17·67	12 0	..	140·78	..	..	..	..	..	..
15	..	..	..	..	..	13·00	12 0	..	..	178·08
16	..	..	..	..	..	12·00	12 0	..	193·76	..
17	..	..	..	..	..	12·50	11 0	171·95	..	..
19	17·00	5 0	57·11	..	..	..	..	..	..	..
„	18·00	6 0	..	..	63·99	..	..	..	..	..
20	17·17	12 0	..	..	134·17	..	..	..	..	..
21	17·33	6 0	..	..	66·47	12·00	2 45	..	..	44·21
22	..	..	..	..	..	14·20	8 45	..	..	118·88
23	..	..	..	..	..	13·67	6 0	85·77	..	..
„	..	..	..	..	..	15·00	6 0	..	77·50	..
24	20·00	1 0	..	10·37	..	11·00	1 0	17·76	..	..
„	16·00	4 45	..	..	56·99	14·00	7 0	..	..	96·46
Total -	(17·42)	99 0	57·11	232·82	818·95	(12·81)	109 0	391·27	459·83	797·06

Table III.

Detailed Record of the Amounts of Green Produce obtained in the Experiments on Permanent Grass Land.

Second Season 1862.

Green Grass obtained (calculated per acre).

Dates of Cuttings.	Five-acre Field.												Ten-acre Field.											
	Without Sewage.				With Sewage.								Without Sewage.				With Sewage.							
	Plot 1.*				Plot 2.				Plot 3.				Plot 4.				Plot 1.*				Plot 2.			
	tons.	cwts.	grs.	lbs.	tons.	cwts.	grs.	lbs.	tons.	cwts.	grs.	lbs.	tons.	cwts.	grs.	lbs.	tons.	cwts.	grs.	lbs.	tons.	cwts.	grs.	lbs.
	1st Crop.				1st Crop.				1st Crop.				1st Crop.				1st Crop.				1st Crop.			
May 1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
3	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
5	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
6	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
7	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0	16	0	21
8	..	..	..	..	..	..	..	..	..	..	..	..	0	8	0	15	..	..	..	..	0	13	2	6
9	..	..	..	..	..	..	..	..	..	..	..	..	0	8	2	14	..	..	..	..	1	0	2	9
10	..	..	..	..	..	..	..	..	..	..	..	..	1	3	1	15	..	..	..	..	1	18	2	24
12	..	..	..	..	..	..	..	..	..	..	..	..	0	13	1	22	..	..	..	..	..	..	..	..
13	..	..	..	..	..	..	..	..	..	..	..	..	0	11	3	22	..	..	..	..	0	16	3	24
14	..	..	..	..	..	..	..	..	..	..	..	..	0	12	0	26	..	..	..	..	..	..	..	..
15	..	..	..	..	..	..	..	..	..	..	..	..	0	12	2	20	..	..	..	..	..	..	..	..
16	..	..	..	..	..	..	..	..	..	..	..	..	0	11	1	27	..	..	..	..	..	..	..	..
17	..	..	..	..	..	..	..	..	..	..	..	..	1	5	2	0	..	..	..	..	1	12	0	15
19	..	..	..	..	..	..	..	..	..	..	..	..	0	14	1	19	..	..	..	..	0	14	2	6
20	..	..	..	..	..	..	..	..	..	..	..	..	0	12	2	16	..	..	..	..	..	..	..	..
21	..	..	..	..	..	..	..	..	..	..	..	..	0	13	1	6	..	..	..	..	0	5	3	12
22	..	..	..	..	..	..	..	..	0	11	1	18	..	..	..	..	..	..	..	..	0	15	3	7
23	..	..	..	..	..	..	..	..	1	19	1	6	..	..	..	..	..	..	..	..	..	..	..	..
24	..	..	..	..	..	..	..	..	2	8	0	18	..	..	..	..	..	..	..	..	..	..	..	..
26	..	..	..	..	..	..	..	..	1	14	2	6	..	..	..	..	..	..	..	..	..	..	..	..
27	..	..	..	..	0	17	3	12	0	11	1	9	..	..	..	..	..	..	..	..	..	..	..	..
28	..	..	..	..	..	..	..	..	0	10	2	0	..	..	..	..	..	..	..	..	0	17	0	9
29	..	..	..	..	0	1	2	7	0	9	3	18	..	..	..	..	0	4	3	6	..	..	..	..
30	..	..	..	..	..	..	..	..	0	10	1	25	..	..	..	..	..	..	..	..	..	..	..	..
31	..	..	..	..	..	..	..	..	1	0	0	21	..	..	..	..	0	12	2	10	..	..	..	..
Monthly Total	..				0	19	1	19	9	15	3	9	8	7	3	6	0	17	1	16	1	14	0	5

Dates of Cuttings.	Five-acre Field.												Ten-acre Field.											
	Without Sewage.				With Sewage.								Without Sewage.				With Sewage.							
	Plot 1.*				Plot 2.				Plot 3.				Plot 4.				Plot 1.*				Plot 2.			
	1st Crop.				1st Crop. (*cont.*)				1st Crop. (*cont.*)				1st Crop. (*cont.*)				1st Crop. (*cont.*)				1st Crop. (*cont.*)			
June 2	..	..	..	..	..	..	..	..	0	10	3	9	..	..	..	..	0	6	3	23	..	..	..	..
3	..	..	..	..	..	..	..	..	0	9	0	23	..	..	..	..	0	6	1	16	..	..	..	..
4	..	..	..	..	..	..	..	..	0	10	1	4	..	..	..	..	0	4	2	26	..	..	..	..
5	..	..	..	..	..	..	..	..	0	9	0	25	..	..	..	..	..	..	..	..	..	..	..	..
6	..	..	..	..	..	..	..	..	..	..	..	..	0	9	3	22	0	4	2	26	0	9	1	1
7	..	..	..	..	..	..	..	..	..	..	..	..	0	15	3	13	0	10	1	23	1	10	3	4
9	..	..	..	..	..	..	..	..	..	..	..	..	0	8	1	2	0	6	1	23	0	14	0	21
10	..	..	..	..	..	..	..	..	..	..	..	..	0	11	0	6	0	6	0	3	0	19	2	17
11	..	..	..	..	..	..	..	..	..	..	..	..	0	8	2	27	0	7	0	12	1	2	1	16
12	..	..	..	..	..	..	..	..	..	..	..	..	0	10	0	8	0	6	1	19	0	12	1	7
13	..	..	..	..	..	..	..	..	..	..	..	..	0	10	0	17	0	5	1	4	0	14	0	27
14	..	..	..	..	..	..	..	..	..	..	..	..	0	14	2	6	0	10	3	18	0	16	2	23
16	..	..	..	..	..	..	..	..	..	..	..	..	0	9	0	13	0	7	0	12	0	13	2	5
17	..	..	..	..	..	..	..	..	..	..	..	..	0	8	3	6	0	5	1	25	0	13	0	4
18	..	..	..	..	..	..	..	..	..	..	..	..	0	8	3	7	0	5	0	14	0	14	1	6
19	..	..	..	..	..	..	..	..	2	0	0	14	14	3	0	21	0	4	2	26	0	15	1	21
20	..	..	..	..	..	..	..	..	0	9	3	4	Total 1st Crop.				0	5	0	12	0	13	2	14
21	1	5	3	18	..	..	..	..	0	19	2	11					0	12	0	9	1	5	0	7
23	0	12	3	9	..	..	..	..	0	7	0	20					0	5	2	3	0	13	0	4
24	1	0	2	22	15	12	0	7	..	..	..	..	..	..	..	..	0	4	1	3	0	13	0	2
25	0	8	2	24	Total 1st Crop.				..	..	..	..	..	..	..	..	0	4	2	21	0	12	1	22
26	0	19	1	15					..	..	..	..	..	..	..	..	0	5	0	26	0	14	0	25
27	..	..	..	..					..	..	..	..	..	..	..	..	0	4	2	27	0	12	3	1
28	0	5	2	13	0	14	0	23	..	..	..	..	..	..	..	..	0	11	0	4	16	14	0	8
30	0	2	3	13	0	8	1	11	..	..	..	..	..	..	..	..	..	..	..	..	Total 1st Crop.			
Monthly Total	0	8	1	26	5	10	0	10	5	16	0	26	5	15	1	15	7	10	2	11	15	0	0	3

Dates of Cuttings.	Five-acre Field.								Ten-acre Field.							
	With Sewage.								With Sewage.							
	Plot 3.				Plot 4.				Plot 3.				Plot 4.			
	tons.	cwts.	grs.	lbs.	tons.	cwts.	grs.	lbs.	tons.	cwts.	grs.	lbs.	tons.	cwts.	grs.	lbs.
	1st Crop. (*cont.*)				1st Crop. (*cont.*)				1st Crop. (*cont.*)				2d Crop.			
June 2	..	..	..	..	..	..	..	..	0	14	1	4	..	..	..	..
3	..	..	..	..	..	..	..	..	0	14	2	1	..	..	..	..
4	..	..	..	..	..	..	..	..	0	7	3	3	..	..	..	..
5	..	..	..	..	..	..	..	..	0	11	0	12	..	..	..	..
6	..	..	..	..	0	9	3	22	14	1	0	27	..	..	..	..
7	..	..	..	..	0	15	3	13	Total 1st Crop.				..	..	..	..
9	..	..	..	..	0	8	1	2					..	..	..	..
10	..	..	..	..	0	11	0	6					..	..	..	..
11	..	..	..	..	0	8	2	27					..	..	..	..
12	..	..	..	..	0	10	0	8					..	..	..	..
13	..	..	..	..	0	10	0	17					..	..	..	..
14	..	..	..	..	0	14	2	6					..	..	..	..
16	..	..	..	..	0	9	0	13					..	..	..	..
17	..	..	..	..	0	8	3	6					..	..	..	..
18	..	..	..	..	0	8	3	7					..	..	..	..
19	14	3	0	21	..	..	..	..					..	..	..	..
20	Total 1st Crop.				..	..	..	..					..	..	..	..
21					..	..	..	..					..	..	..	..
23					..	..	..	..					..	..	..	..
24	..	..	..	..	..	..	..	..					..	..	..	..
25	..	..	..	..	..	..	..	..					..	..	..	..
26	..	..	..	..	..	..	..	..					..	..	..	..
27	..	..	..	..	..	..	..	..					..	..	..	..
28	..	..	..	..	0	11	0	4					0	18	0	7
30	..	..	..	..	..	..	..	..					0	17	1	0
Monthly Total	2	7	2	20	1	15	1	7								

* Area of Plot 1, five-acre field = 0·80756 acre, and of Plot 1, ten-acre field = 0·79275 acre; for the areas of the sewaged plots, see preceding Tables I. and II. of sewage applied.

Table III.—*continued.*

Detailed Record of the Amounts of Green Produce obtained in the Experiments on Permanent Grass Land.

Second Season 1862.

Dates of Cuttings.	Green Grass obtained (calculated per acre).															
	Five-acre Field.								Ten-acre Field.							
	Without Sewage.	With Sewage.							Without Sewage.	With Sewage.						
	Plot 1.	Plot 2.			Plot 3.			Plot 4.	Plot 1.	Plot 2.			Plot 3.			Plot 4.
	tons. cwts. qrs. lbs.	tons. cwts. qrs. lbs.			tons. cwts. qrs. lbs.			tons. cwts. qrs. lbs.	tons. cwts. qrs. lbs.	tons. cwts. qrs. lbs.			tons. cwts. qrs. lbs.			tons. cwts. qrs. lbs.
	1st Crop. (*cont.*)	1st Crop. (*cont.*)						2d Crop.	1st Crop. (*cont.*)	2d Crop.			2d Crop.			2d Crop. (*cont.*)
July 1	0 2 1 10	0 9 0 22			..			..	0 5 3 6	..			..			0 12 3 3
2	0 2 2 9	0 8 0 3			..			..	..	..			..			0 18 0 0
3	0 2 0 26	0 8 1 19			..			..	0 3 0 17	..			..			0 15 2 0
4	..	0 3 2 8			..			..	0 3 1 24	..			..			0 7 1 20
5	0 5 1 16	0 15 2 8			..			..	0 8 3 11	..			..			1 10 3 25
7	0 2 2 17	0 9 0 5			..			..	0 4 0 25	..			..			0 16 2 11
8	0 2 2 9	0 4 2 7			..			0 0 3 8	0 6 1 16	..			..			0 16 3 22
9	0 2 3 11	0 7 1 12			..			..	0 5 2 6	..			..			0 18 2 10
10	0 2 1 0	0 7 2 11			..			..	..	..			..			0 16 0 0
11	0 2 2 19	0 7 1 11			..			..	0 3 2 17	..			..			0 16 1 12
12	0 5 3 18	0 17 2 23			..			..	0 6 3 27	..			1 7 1 19			0 7 0 11
14	0 2 3 5	0 8 1 18			..			..	0 3 1 19	..			0 12 2 11			[10 11 2 9]
15	0 2 1 12	0 8 1 14			..			..	[10 19 1 27]	..			0 14 2 26			Total
16	0 2 1 10	0 7 1 25			..			..		..			0 18 3 1			2d Crop.
17	0 2 1 8	0 7 0 12			..			..	Total	..			0 14 1 26			..
18	0 2 2 8	0 8 3 0			..			..	1st Crop.	..			0 16 2 7			..
19	0 4 2 15	0 12 0 23			..			..	..	0 3 3 21			1 5 1 0			..
21	0 2 1 6	0 6 0 12			..			..	..	..			[6 9 3 6]			..
22	0 2 1 13	0 5 3 22			..			..	..	..			Total			..
23	0 2 0 26	[14 12 1 4]			..			0 8 1 5	..	..			2d Crop.			..
24	0 2 2 12	..			..			0 8 2 4	..	0 4 3 3			..			..
25	0 2 1 3	Total			..			0 10 0 6	..	..			..			..
26	0 4 2 16	1st Crop.			..			0 15 1 14	..	..			..			..
28	0 2 1 17	..			..			0 9 0 17	..	..			..			..
29	0 1 3 22	..			..			0 8 2 24	..	..			..			..
30	0 1 3 17	..			..			1 1 0 17	..	..			..			..
31	0 5 0 6	..			..			0 17 1 8	..	..			..			..
Monthly Total	3 16 0 23	8 2 3 3			..			4 19 1 19	2 11 2 0	0 8 2 24			6 9 3 6			8 16 1 2
	1st Crop. (*cont.*)	2d Crop.			2d Crop.			2d Crop. (*cont.*)	2d Crop.	2d Crop. (*cont.*)						3d Crop.
Aug. 1	0 4 3 20	..			..			0 18 2 1	..	..			..			..
2	0 10 0 12	..			0 9 3 0			1 2 0 23	..	..			..			..
4	0 1 2 20	..			0 9 0 5			[7 0 0 15]	..	..			..			..
5	0 1 3 19	..			0 9 1 8				..	..			..			..
6	0 2 1 0	..			0 11 0 14			Total	..	..			..			..
7	0 2 0 1	..			0 12 3 8			2d Crop.	..	..			..			..
8	0 2 0 21	..			0 9 3 20			..	..	..			..			..
9	0 4 1 13	..			0 19 3 9			..	..	..			..			..
11	0 1 3 27	..			0 9 2 9			..	..	..			..			..
12	0 1 2 9	..			0 9 3 3			..	..	..			..			..
13	0 1 2 20	..			0 9 2 15			..	..	..			..			..
14	0 2 3 11	..			0 12 1 24			..	..	..			..			..
15	0 1 3 16	..			0 9 1 1			..	..	..			..			..
16	0 2 3 26	..			0 18 1 4			..	..	..			..			..
18	0 2 1 12	..			0 12 1 11			..	..	..			..			..
19	0 1 3 16	..			0 10 1 1			..	..	0 16 0 22			..			..
20	0 1 3 19	..			0 10 0 19			..	..	0 10 1 0			..			..
21	[6 13 1 3]	..			0 8 2 14			..	..	0 15 3 1			..			..
22	Total	0 10 1 4			[9 12 0 25]			..	..	0 18 1 11			..			..
23	1st Crop.	0 19 0 27						..	..	1 17 2 24			..			..
25	..	0 8 1 25			Total			..	..	0 13 1 5			..			..
26	..	0 9 2 20			2d Crop.			..	..	0 17 2 10			..			..
27	..	0 10 1 9			..			..	..	0 3 0 14			..			0 10 3 18
28	..	0 9 2 14			..			..	0 3 1 19	[7 0 3 27]			..			0 18 1 21
29	..	0 9 0 13			..			..	0 3 1 24				..			0 15 0 7
30	..	0 19 3 16			..			..	0 4 3 13	Total			..			0 11 1 23
Monthly Total	2 8 2 10	4 16 2 16			9 12 0 25			2 0 2 24	0 11 3 0	6 12 1 3			..			2 15 3 8

Table III.—*continued.*

Detailed Record of the Amounts of Green Produce obtained in the Experiments on Permanent Grass Land.

Second Season 1862.

Green Grass obtained (calculated per acre).

Dates of Cuttings.	Five-acre Field.								Ten-acre Field.							
	Without Sewage.	With Sewage.							Without Sewage.	With Sewage.						
	Plot 1.	Plot 2.			Plot 3.			Plot 4.	Plot 1.	Plot 2.			Plot 3.			Plot 4.
	tons. cwts. qrs. lbs.	*tons. cwts. qrs. lbs.*			*tons. cwts. qrs. lbs.*			*tons. cwts. qrs. lbs.*	*tons. cwts. qrs. lbs.*	*tons. cwts. qrs. lbs.*			*tons. cwts. qrs. lbs.*			*tons. cwts. qrs. lbs.*
Sept. 1	..	2d Crop. (*cont.*)			3d Crop.			3d Crop.	2d Crop. (*cont.*)	3d Crop.			3d Crop.			3d Crop. (*cont.*)
	..	0 10 2 25			..			..	0 3 2 16	..			..			0 14 1 13
2	..	0 11 0 9			..			..	0 5 0 5	..			..			0 16 0 0
3	..	0 10 3 13			..			..	0 5 0 7	..			..			0 14 0 0
4	..	0 10 1 10			..			..	0 4 3 27	..			..			0 19 0 2
5	..	0 10 0 10			..			..	0 4 3 17	..			..			1 9 2 12
6	..	0 19 2 22			..			..	0 10 2 25	..			0 3 1 1			1 9 2 13
8	..	0 7 2 5			..			..	0 5 0 23	..			0 6 0 24			8 18 1 20
9	..	8 16 3 26			..			..	0 4 1 26	..			0 17 1 1			Total 3d Crop.
10	..	Total 2d Crop.			..			..	0 5 0 8	..			0 17 2 22			
11	..				..			0 1 3 15	0 5 3 10	..			0 16 0 14			
12	..	..			..			0 10 0 14	0 4 1 12	..			0 16 0 7			..
13	..	..			..			0 18 0 6	0 8 3 9	..			1 13 3 1			..
15	..	..			..			0 11 0 27	3 19 3 17	..			1 1 2 24			..
16	..	..			..			0 10 2 14	Total 2d Crop.	..			0 17 3 22			..
17	..	..			..			0 11 2 6		..			1 1 1 3			..
18	..	..			..			0 11 3 23		..			0 16 0 7			..
19	..	..			..			0 11 1 3		..			0 9 0 8			..
20	..	..			..			0 18 0 22	..	..			9 16 1 22			..
22	..	..			0 17 0 21			0 10 0 22	..	..			Total 3d Crop.			..
23	..	..			0 19 0 0			0 9 0 26	..	..			..			..
24	..	..			0 18 1 1			0 10 0 0	..	..			..			..
25	..	..			1 2 2 6			0 11 2 9	..	..			..			..
26	..	..			0 18 2 3			0 10 0 16	..	..			..			..
27	..	..			1 17 0 7			0 18 0 12	..	..			..			..
29	..	..			..			0 10 2 18	..	..			..			..
30	..	..			..			0 10 0 19	..	0 16 0 8			..			..
								9 15 0 0								
								Total 3d Crop.								
Monthly Total	..	4 0 1 10			6 12 2 10			9 15 0 0	3 8 0 17	0 16 0 8			9 16 1 22			6 2 2 12
	2d Crop.	3d Crop.			3d Crop. (*cont.*)			4th Crop.		3d Crop. (*cont.*)			4th Crop.			4th Crop.
Oct. 1	..	..			0 14 0 19			..	..	0 12 3 3			..			..
2	..	..			0 10 2 25			..	..	0 14 3 3			..			..
3	..	0 8 3 14			0 3 2 7			..	..	0 14 0 20			..			..
4	0 4 3 2	0 17 3 6			8 1 0 5			..	..	0 9 3 24			..			0 18 2 0
6	0 2 1 8	0 6 3 10			Total 3d Crop.			..	..	3 7 3 2			..			..
7	0 2 1 3	0 11 0 24						..	..	Total 3d Crop.			..			..
8	0 2 1 6	0 9 1 5						..	..				..			..
9	0 2 1 4	0 9 1 9			..			..	..	..			..			..
10	0 2 1 24	0 9 1 17			..			..	..	..			..			1 5 2 4
11	0 4 2 1	0 5 2 8			..			..	..	..			..			..
13	0 2 1 3	3 18 1 9			..			..	..	..			..			0 17 0 15
14	0 2 1 8	Total 3d Crop.			..			0 9 2 1	..	..			0 12 1 6			..
15	0 2 1 0				..			0 8 1 25	..	..			0 19 1 8			..
16	0 2 1 4				..			0 8 3 18	..	..			0 3 1 1			0 0 3 14
17	1 10 0 7	..			..			0 4 1 26	..	..			1 14 3 15			3 2 0 5
	Total 2d Crop.	..			4th Crop.								Total 4th Crop.			Total 4th Crop.
18 28		4th Crop.			0 14 1 13			1 11 1 14	..	..						
		0 10 2 7			0 10 1 25			Total 4th Crop.	..	4th Crop.			..			5th Crop.
29	..				1 4 3 10				..	0 8 1 11			..			0 6 0 21
30	..	Total 4th Crop.			Total 4th Crop.				..	Total 4th Crop.						Total 5th Crop.
31	..								..							
Monthly Total	1 10 0 7	4 8 3 16			2 13 1 5			1 11 1 14	..	3 0 0 5			1 14 3 15			3 8 0 26
Nov. 7	..	..			..			..	3d Crop. 1 10 3 9	..			..			..
									Total 3d Crop.							
Monthly Total	..	..			..			..	1 10 3 9	..			..			..

Table IV.

Detailed Record of the Amounts of Green Produce obtained in the Experiments on Permanent Grass Land.

Third Season 1863.

Dates of Cuttings.	Green Grass obtained (calculated per acre).															
	Five-acre Field.								Ten-acre Field.							
	Without Sewage.	With Sewage.							Without Sewage.	With Sewage.						
	Plot 1.	Plot 2.			Plot 3.			Plot 4.	Plot 1.	Plot 2.			Plot 3.			Plot 4.
	tons. cwts. qrs. lbs.	tons. cwts. qrs. lbs.			tons. cwts. qrs. lbs.			tons. cwts. qrs. lbs.	tons. cwts. qrs. lbs.	tons. cwts. qrs. lbs.			tons. cwts. qrs. lbs.			tons. cwts. qrs. lbs.
								1st Crop.								1st Crop.
April 20	..	..			..			..	..	..			..			0 10 1 0
21	..	..			..			..	..	..			..			0 14 3 0
22	..	..			..			..	..	..			..			0 15 1 0
23	..	..			..			0 14 2 20	..	..			..			..
25	..	..			..			..	..	..			..			0 16 1 0
27	..	..			..			0 17 1 18	..	..			..			..
28	..	..			..			0 18 3 17	..	..			..			..
29	..	..			..			1 5 3 13	..	..			..			..
30	..	..			..			..	..	..			..			0 18 1 0
Monthly Total	..	..			..			3 16 3 12	..	..			..			3 14 3 0
		1st Crop.			1st Crop.			1st Crop.					1st Crop.			1st Crop.
May 1	..	..			..			0 12 1 21	..	..			..			..
2	..	..			..			2 1 0 5	..	..			..			..
4	..	..			..			0 15 2 19	..	..			..			..
5	..	..			..			0 12 2 20	..	..			..			..
6	..	..			..			0 14 2 20	..	..			..			..
7	..	..			..			..	..	..			..			0 15 3 0
8	..	..			..			..	..	..			..			2 0 3 27
9	..	..			0 16 0 13			1 3 2 14	..	..			..			..
11	..	..			2 9 0 16			[9 16 3 27]	..	..			..			..
12	..	..			1 10 3 15			Total	..	..			..			..
13	..	..			1 15 3 26			1st Crop.	..	..			..			..
14	..	..			..			..	..	..			0 19 1 9			0 16 2 0
15	..	..			..			..	..	..			1 4 3 11			0 14 2 0
16	..	..			..			..	..	..			1 12 2 14			[8 2 1 27]
18	..	..			1 15 2 24			..	..	..			..			Total
19	..	..			1 13 0 4			..	..	..			..			1st Crop.
20	..	..			1 11 1 19			..	..	..			..			..
21	..	..			..			..	..	..			1 13 0 15			..
22	..	..			..			..	..	..			1 14 3 15			..
23	..	..			..			..	..	..			1 15 1 16			..
25	..	0 11 3 8			0 12 2 13			..	..	..			..			..
26	..	0 16 2 11			[12 4 3 18]			..	..	..			..			..
27	.	0 12 1 14			Total			..	..	..			..			..
28	..	0 11 1 1			1st Crop.			..	..	..			..			..
29	..	0 11 2 1			..			..	..	..			..			..
30	..	1 5 3 18			..			..	..	..			..			..
Monthly Total	..	4 9 1 25			12 4 3 18			6 0 0 15	..	..			9 0 0 24			4 7 2 27

Table IV.—*continued.*

Detailed Record of the Amounts of Green Produce obtained in the Experiments on Permanent Grass Land.

Third Season 1863.

Dates of Cuttings.	Green Grass obtained (calculated per acre).															
	Five-acre Field.								Ten-acre Field.							
	Without Sewage.	With Sewage.							Without Sewage.	With Sewage.						
	Plot 1.	Plot 2.			Plot 3.			Plot 4.	Plot 1.	Plot 2.			Plot 3.			Plot 4.
	tons. cwts. grs. lbs.	tons. cwts. grs. lbs.			tons. cwts. grs. lbs.			tons. cwts. grs. lbs.	tons. cwts. grs. lbs.	tons. cwts. grs. lbs.			tons. cwts. grs. lbs.			tons. cwts. grs. lbs.
		1st Crop. (*cont.*)			2d Crop.			2d Crop.	1st Crop.	1st Crop.			1st Crop. (*cont.*)			2d Crop.
June 1	..	0 11 3 22			..			..	..	..			..			..
2	..	0 10 0 14			..			..	..	..			..			..
3	..	1 10 1 21			..			..	..	..			..			..
4	..	..			..			..	..	..			1 13 0 8			..
5	..	..			..			..	..	..			0 18 0 23			..
6	..	..			..			..	..	1 10 3 14			0 17 2 8			..
8	..	..			..			..	..	1 11 2 3			[12 9 0 7]			..
9	..	..			..			..	..	1 10 3 1			Total			..
10	..	..			..			..	..	1 13 1 24			1st Crop.			..
11	..	..			..			..	..	1 12 2 5			..			..
12	..	..			..			..	..	1 12 2 17			..			..
13	..	..			..			..	..	1 19 2 13			..			..
15	..	0 13 2 18			..			..	..	..			..			..
16	..	1 8 3 5			..			..	..	..			..			..
17	..	1 9 3 7			..			..	..	..			..			..
18	..	[10 14 1 0]			..			..	..	1 10 2 1			..			..
19	..	Total			..			..	..	[13 1 3 22]			..			1 15 0 0
20	..	1st Crop.			..			2 5 3 18	..	Total			..			..
22	..	..			..			1 11 1 11	..	1st Crop.			..			..
23	..	..			0 16 2 7			..	..	..			..			..
24	..	..			0 14 3 10			..	0 4 0 11	..			2d Crop.			7 6 0 23
25	..	..			..			4 6 3 0	0 5 2 3	..			0 12 1 19			2 12 1 26
26	..	..			..			2 9 1 27	0 5 3 25	..			0 9 1 6			[11 13 2 21]
27	..	..			..			[10 13 2 0]	0 6 3 1	..			1 5 2 14			Total
29	..	..			0 18 3 6			Total	1 5 3 0	..			..			2d Crop.
30	..	..			0 19 1 25			2d Crop.	0 19 3 13	..			..			..
Monthly Total	..	6 4 3 3			3 9 2 20			10 13 2 0	3 7 3 25	13 1 3 22			5 16 0 22			11 13 2 21

	1st Crop.	2d Crop.	2d Crop. (*cont.*)		1st Crop. (*cont.*)	2d Crop.	2d Crop. (*cont.*)	3d Crop.
July 1	..	..	1 0 3 0	..	0 14 0 22	..	..	..
2	..	..	..	..	0 7 3 15	..	0 12 0 20	..
3	..	..	..	..	0 8 0 7	..	0 15 3 19	..
4	..	..	..	..	0 12 0 11	..	1 6 0 3	..
6	..	..	0 16 1 0	..	..	..	..	..
7	..	..	0 17 3 20	..	..	..	..	..
8	..	..	1 0 0 9	..	0 6 1 24	..	..	..
9	2 6 0 6	..	..	..	0 4 1 26	..	1 0 0 17	..
10	..	..	..	..	0 6 3 6	..	1 0 3 10	..
11	0 4 0 23	..	1 7 1 12	..	[6 7 3 24]	..	[7 2 1 24]	..
13	0 3 0 23	..	0 15 0 17	..	Total	..	Total	..
14	0 4 0 13	0 10 0 19	[9 7 0 22]	..	1st Crop.	..	2d Crop.	..
15	0 3 0 1	0 13 1 11	Total	..	..	..	..	..
16	..	0 16 1 11	2d Crop.	..	..	..	..	..
17	..	1 0 0 0	..	..	..	..	..	..
18	0 9 1 4	1 8 0 27	..	..	..	..	..	..
20	0 3 2 17	1 4 2 23	..	..	..	..	..	..
22	..	..	..	..	..	0 6 3 10	..	..
23	..	..	..	..	..	0 15 0 3	..	..
24	..	..	..	..	..	0 13 3 20	..	..
25	..	..	..	..	..	1 9 2 13	..	..
27	0 5 1 11	0 15 0 2	..	..	..	..	..	..
28	[3 18 3 14]	[6 7 3 9]	..	..	..	0 18 2 26	..	..
29	Total	Total	..	..	..	1 1 2 2	..	..
30	1st Crop.	2d Crop.	..	..	..	0 7 1 16	..	..
31	..	..	..	..	..	[5 13 0 6]	..	0 9 3 12
						Total		
Monthly Total	3 18 3 14	6 7 3 9	5 17 2 2	..	2 19 3 27	5 13 0 6	4 15 0 13	0 9 3 12

Table IV.—*continued.*

Detailed Record of the Amounts of Green Produce obtained in the Experiments on Permanent Grass Land.

Third Season 1863.

Dates of Cuttings.	Green Grass obtained (calculated per acre).															
	Five-acre Field.								Ten-acre Field.							
	Without Sewage.	With Sewage.							Without Sewage.	With Sewage.						
	Plot 1.	Plot 2.			Plot 3.				Plot 4.		Plot 1.	Plot 2.			Plot 3.			
	tons.	*cwts.*	*grs.*	*lbs.*	*tons.*	*cwts.*	*grs.*	*lbs.*	*tons.*	*cwts.*	*grs.*	*lbs.*	*tons.*	*cwts.*	*grs.*	*lbs.*	*tons.*	*cwts.*	*grs.*	*lbs.*
					3d Crop.				3d Crop.						3d Crop.		3d Crop. (*cont.*)			
Aug. 1	..		..		..				1	11	1	3	..		..		..			
3	..		..		..				0	18	0	18	..		..		..			
4	..		..		..				0	14	3	26	..		..		..			
5	..		..		..				0	19	2	3	..		..		..			
6	..		..		..				0	19	0	8	..		..		..			
7	..		..		..				..				..		..		0	15	2	0
8	..		..		1	12	3	10	..				..		..		..			
10	..		..		1	3	2	15	..				..		..		..			
11	..		..		..				..				..		..		0	15	0	0
12	..		..		..				..				..		..		0	14	0	0
13	..		..		..				0	16	2	5	..		..		..			
14	..		..		..				0	19	0	3	..		..		..			
15	..		..		1	6	1	8	[6	18	2	5]	..		..		..			
17	..		..		..								..		..		0	15	1	0
18	..		..		..				Total 3d Crop.				..		..		0	15	2	0
19	..		..		..								..		..		0	16	1	0
20	..		..		..				..				..		..		0	16	1	14
21	..		..		..				..				..		..		0	16	3	0
22	..		..		..				..				..		..		1	12	0	0
24	..		..		..				..				..		0	14	3	7	[8	6	1	26]
25	..		..		..				..				..		0	12	3	6				
26	..		..		..				..				..		0	15	3	7	Total 3d Crop.			
27	..		..		..				..				..		1	0	1	9				
28	..		..		..				..				..		0	15	3	7	..			
29	..		..		..				4th Crop.				..		1	15	0	20	..			
31	..		..		..				0	17	1	11	..		..		..		..			
Monthly Total	..		..		4	2	3	5	7	15	3	16	..		..		5	14	3	0	7	16	2	14

	2d Crop.				3d Crop.				3d Crop. (*cont.*)				4th Crop. (*cont.*)				2d Crop.				3d Crop.				3d Crop. (*cont.*)				4th Crop.			
Sept. 1	..				..				..				0	18	2	3	..				..				..				..			
2	..				..				..				..				..				..				..				0	12	3	0
3	..				..				0	15	1	7	..				..				..				..				..			
4	..				..				1	8	1	17	..				..				..				..				..			
5	..				..				..				..				..				..				1	5	1	12	..			
7	..				..				0	16	1	0	..				..				..				[7	0	0	12]	..			
8	..				..				[7	2	3	1]	1	8	0	11	..				..				Total 3d Crop.				..			
9	..				..								1	1	3	8	..				..								..			
10	..				..				Total 3d Crop.				..				..				0	18	0	11	..				..			
11	..				..								..				..				1	1	0	1	..				..			
12	..	1	0	3	15				..				..				..				..				..				..			
14	..	0	14	0	10				..				..				..				..				..				..			
15	..				..				..				0	14	1	27	..				..				..				..			
16	..	0	12	2	2				..				..				..				..				..				..			
18	..		..						..				..				..				0	17	3	11	..				..			
19	..		..						..				..				0	11	3	9	1	4	2	6	..				..			
21	..		..						..				0	14	2	13	..				..				..				..			
22	0	5	2	8	..				..				0	17	0	11	..				..				..				..			
23	0	3	2	24	..				..				1	1	1	23	..				..				..				..			
24	0	10	2	23	..				..				0	17	3	18	..				..				..				..			
25	[0	19	3	27]	..				..				[8	11	1	13]	..				0	17	3	13	..				..			
26	Total 2d Crop.				..				4th Crop.				Total 4th Crop.				1	1	0	14	1	1	2	16	..				..			
28					..				1	2	0	25					[1	12	3	23]	[6	1	0	2]	..				..			
29	..				..				1	11	0	17	..												..				..			
30	..				..				0	18	3	13	..				Total 2d Crop.				Total 3d Crop.				..				..			
Monthly Total	0	19	3	27	2	7	1	27	6	12	0	23	7	14	0	2	1	12	3	23	6	1	0	2	1	5	1	12	0	12	3	0

Table IV.—*continued.*

Detailed Record of the Amounts of Green Produce obtained in the Experiments on Permanent Grass Land.

Third Season 1863.

Dates of Cuttings.	Green Grass obtained (calculated per acre).																			
	Five-acre Field.									Ten-acre Field.										
	Without Sewage.				With Sewage.						Without Sewage.				With Sewage.					
	Plot 1.				Plot 2.				Plot 3.			Plot 4.			Plot 1.		Plot 2.		Plot 3.			Plot 4.	
	tons.	cwts.	qrs.	lbs.	tons.	cwts.	qrs.	lbs.	tons.	cwts.	qrs.	lbs.	tons.	cwts.	qrs.	lbs.	tons.	cwts.	qrs.	lbs.	tons.	cwts.	qrs.	lbs.
					3d Crop. (*cont.*)				4th Crop. (*cont.*)				5th Crop.						4th Crop.		4th Crop. (*cont.*)			
Oct. 1	..				..				..				..				..		..		1	10	0	0
2	..				..				..				..				..		..		0	19	3	21
3	..				..				..				..				..		..		1	10	3	10
5	..				..				1	12	1	5	..				..		..		..			
6	..				..				..				..				..		..		0	17	0	14
7	..				..				..				..				..		0	9	0	20	0	14	2	14
8	..				..				..				..				..		1	4	0	25	[6	5	1	3]
9	..				..				..				..				..		1	16	2	3	Total 4th Crop.			
10	..				0	15	3	11	..				..				..		[3	9	3	20]	..			
13	..				0	19	2	14	..				..				..		Total 4th Crop.				..			
14	..				[4	2	3	24]	0	13	2	0	..				..		..				..			
19	..				Total 3d Crop.				[5	18	0	4]	0	14	1	20	..		..				..			
					4th Crop.				Total 4th Crop.				Total 5th Crop.													
20	..				0	9	0	13	..				..				..		..				..			
21	..				0	7	3	5	..				..				..		..				..			
					[0	16	3	18]																		
					Total 4th Crop.																					
Monthly Total	..				2	12	1	15	2	5	3	5	0	14	1	20	..		..		3	9	3	20	5	12	2	3
					5th Crop.				5th Crop.				6th Crop.						4th Crop.		5th Crop.				5th Crop.	
Nov. 27	..				0	3	0	16	0	5	2	10	0	5	2	24	..		..		..		..		..	
28	..				Total 5th Crop.				Total 5th Crop.				Total 6th Crop.				..		0	9	1	6	0	10	0	5	0	11	2	0
																			Total 4th Crop.		Total 5th Crop.				Total 5th Crop.	
Monthly Total	..				0	3	0	16	0	5	2	10	0	5	2	24	..		0	9	1	6	0	10	0	5	0	11	2	0

Table V.

Detailed Record of the Sewage applied, and of the Amounts of Green Produce obtained in Experiments on Italian Rye-grass.

Season 1863.

Dates.	Average time* taken to fill Gauge-tank (3·308 tons).	Time of application.	Sewage applied (calculated per acre). Plot 2. (Area 0·999 acre.)	Sewage applied (calculated per acre). Plot 3. (Area 0·99831 acre.)	Green Grass obtained (calculated per acre). Without Sewage. Plot 1. (Area 1·00484 acre.)	Green Grass obtained (calculated per acre). With Sewage. Plot 2. (Area 0·999 acre.)	Green Grass obtained (calculated per acre). With Sewage. Plot 3. (Area 0·99831 acre.)
	Mins.	H. M.	Tons.	Tons.	tons. cwts. qrs. lbs.	tons. cwts. qrs. lbs.	tons. cwts. qrs. lbs.
					1st Crop.	1st Crop.	1st Crop.
April 24	..	..	..	..	..	0 17 0 2	1 10 2 6
25	..	..	..	..	..	1 12 0 17	0 16 0 3
27	..	..	..	..	..	0 14 1 1	1 9 1 6
28	..	..	..	..	1 3 2 16	1 0 0 2	[3 15 3 15]
29	91·67	12 0	..	26·03	1 5 2 21	[4 3 1 22]	Total 1st Crop.
30	101·67	11 15	..	22·00	0 15 0 12	Total 1st Crop.	
Monthly Total	(96·24)	23 15	..	48·03	3 4 1 21	4 3 1 22	3 15 3 15
May 1	120·00	12 0	19·87	..	0 11 0 22	..	..
2	107·50	11 30	..	21·27	0 12 0 21	..	..
4	137·50	5 0	..	7·23	0 14 1 8	..	..
5	133·33	12 0	..	17·89	[5 2 0 16]	..	..
6	120·00	11 30	19·04	..		..	..
7	117·50	11 30	..	19·46	Total	..	..
8	122·50	11 15	..	18·26	1st Crop.	..	..
9	120·00	11 0	18·21	..	..	..	..
11	123·33	12 0	..	19·35	..	..	..
12	137·50	10 0	..	14·46	..	..	..
13	88·75	11 30	25·75	..	..	..	..
14	112·50	12 0	..	21·21	..	..	..
18	75·00	4 30	..	11·93	..	..	..
19	72·50	12 0	32·89	..	..	..	..
20	69·00	12 0	..	34·58	..	..	2d Crop.
27	67·50	4 30	..	13·25	..	..	0 7 1 21
28	65·60	12 0	36·34	..	..	..	0 2 3 22
29	71·25	10 45	..	30·00	..	..	0 7 3 18
30	72·60	10 30	..	28·76	..	..	0 13 0 2
Monthly Total	(95·80)	197 30	152·10	257·65	1 17 2 23	..	1 11 1 7
June 1	88·75	10 15	22·95	..	..	..	0 7 2 1
2	78·75	12 0	..	30·30	..	..	0 7 1 15
3	101·67	8 45	..	17·11	..	..	0 7 2 13
4	95·00	10 30	21·96	..	..	..	0 11 1 2
5	90·00	12 0	..	26·51	..	..	0 5 0 3
6	90·00	11 0	..	24·30	..	..	0 14 0 3
8	97·50	9 15	..	18·86	..	..	0 10 0 2
9	130·00	11 0	..	16·83	..	..	0 6 0 21
10	85·00	10 15	..	23·97	..	2d Crop.	0 6 3 9
11	76·00	12 0	..	31·39	..	0 5 1 0	0 6 3 11
12	87·50	12 0	..	27·27	..	0 7 2 25	[5 14 0 3]
13	73·75	11 0	..	29·65	..	0 17 0 2	
15	116·67	8 30	14·48	..	..	1 4 2 6	Total
16	102·50	11 15	..	21·82	..	0 12 0 25	2d Crop.
17	96·25	8 45	..	18·07	..	0 6 1 1	..
18	93·75	12 0	25·43	..	..	0 8 1 21	..
19	86·25	12 0	..	27·66	..	0 10 1 21	..
20	85·00	9 0	..	21·05	..	0 14 3 2	..
22	86·25	8 45	20·16	..	2d Crop.	1 2 3 3	..
23	83·33	7 0	16·69	..	0 17 3 18	0 8 2 8	3d Crop.
24	(6·00tanks)	12 0	..	19·88	0 15 0 20	0 3 1 25	0 3 1 1
25	(6·00 „	..	19·87	..	1 1 3 16	[7 1 1 27]	0 5 0 16
26	(5·75 „	..	19·04	..	1 0 3 17		0 9 1 2
27	(5·25 „	..	17·38	..	1 11 3 11	Total	0 11 2 16
29	..	..	..	..	2 6 2 3	2d Crop.	0 10 1 13
30	..	..	..	..	1 3 3 1	..	0 7 1 25
					[8 18 0 2]		
					Total 2d Crop.		
Monthly Total	..	..	177·96	354·66	8 18 0 2	7 1 1 27	6 9 3 13

* When the *number of tanks* is given, the flow was too slow and irregular to estimate it by the average time taken to fill the gauge-tank, and therefore the actual number of tankfuls was counted.

TABLE V.—*continued.*

Detailed Record of the Sewage applied, and of the Amounts of Green Produce obtained in Experiments on Italian Rye-grass.

Season 1863.

DATES.	Average Time* taken to fill Gauge-tank (3·308 tons).	Time of application.	Sewage applied (calculated per acre).		Green Grass obtained (calculated per acre).											
					Without Sewage.				With Sewage.							
			Plot 2. (Area 0·999 acre.)	Plot 3. (Area 0·99831 acre.)	Plot 1. (Area 1·00484 acre.)				Plot 2. (Area 0·999 acre.)				Plot 3. (Area 0·99831 acre.)			
					tons.	cwts.	qrs.	lbs.	tons.	cwts.	qrs.	lbs.	tons.	cwts.	qrs.	lbs.
	Mins.	H. M.	Tons.	Tons.									3d Crop.			
July 1	(3·25tanks)	..	10·76	..	..				..				6	6	1	1
2	(5·75 „)	..	19·04	..	..				..				0	11	0	18
3	(5·00 „)	..	..	16·57	..				..				0	7	0	1
4	(3·00 „)	..	9·93	..	..				..				0	14	0	3
6	(1·50 „)	..	..	4·97	..				..				0	9	1	2
„	30·50	2 0	..	13·04	..				..							
7	(4·75tanks)	..	15·73	..	..				..				0	14	1	3
„	31·50	2 0	12·62	..	..				..							
8	(2·75tanks)	..	..	9·11	..				..				0	5	3	1
„	26·50	2 0	..	15·01	..				..							
9	(6·00tanks)	..	19·87	..	..				..				0	7	3	1
10	(4·73 „)	..	..	15·67	..				..				0	9	0	12
11	(6·30 „)	..	..	20·88	..				..				0	15	2	10
13	(2·52 „)	..	..	8·35	..				3d Crop. 0 10 0 11				7	7	1	18
„	24·50	2 0	..	16·23												
14	(3·00tanks)	..	..	9·94	..				0 8 2 1				Total 3d Crop.			
„	23·50	2 0	..	16·92												
15	(5·18tanks)	..	..	17·16	..				0 7 0 18				..			
„	24·50	2 0	..	16·23												
16	(6·75tanks)	..	..	22·37	..				0 7 0 6				..			
„	24·00	2 0	..	16·57												
17	(4·93tanks)	..	..	16·34	..				0 10 0 27				..			
„	24·50	2 0	..	16·23												
18	(6·00tanks)	..	..	19·88	..				0 13 0 1				..			
20	(3·00 „)	..	..	9·94	..				0 6 3 9				..			
„	23·50	2 0	..	16·92												
21	(4·00tanks)	..	13·25	..	..				0 7 0 15				..			
„	25·50	2 0	15·58	..												
22	(3·75tanks)	..	12·42	..	..				0 10 2 1				..			
„	25·50	2 0	15·58	..												
23	(7·00tanks)	..	..	23·20	..				0 5 2 25				..			
„	29·50	2 0	..	13·48												
24	(6·83tanks)	..	22·62	..	..				0 7 0 17				..			
„	32·50	2 0	12·23	..												
25	(2·30tanks)	..	..	7·62	..				0 13 2 22				..			
„	28·00	2 0	..	14·20												
27	(3·55tanks)	..	..	11·76	..				0 7 0 7				..			
„	29·50	2 0	..	13·48												
28	(1·00tank)	..	3·31	..	..				0 2 3 6				4th Crop. 0	6	0	15
„	32·50	2 0	12·23	..												
29	(0·93tanks)	..	..	3·08	..				5 16 3 21				0	7	2	1
30	(6·93 „)	..	22·95	..	..				Total 3d Crop.				0	9	1	8
31	(5·43 „)	..	..	17·99	..								0	7	2	1
Monthly Total	..	..	218·12	403·14	..				5	16	3	21	6	10	2	21

* When the *number of tanks* is given, the flow was too slow and irregular to estimate it by the average time taken to fill the gauge-tank, and therefore the actual number of tankfuls was counted.

TABLE V.—*continued.*

Detailed Record of the Sewage applied, and of the Amounts of Green Produce obtained in Experiments on Italian Rye-grass.

Season 1863.

DATES.	Average time * taken to fill Gauge-tank (3·308 tons).	Time of application.	Sewage applied (calculated per acre). Plot 2. (Area 0·999 acre.)	Sewage applied (calculated per acre). Plot 3. (Area 0·99831 acre.)	Green Grass obtained (calculated per acre). Without Sewage. Plot 1. (Area 1·00484 acre.)	With Sewage. Plot 2. (Area 0·999 acre.)	With Sewage. Plot 3. (Area 0·99831 acre.)
		H. M.	Tons.	Tons.	tons. cwts. grs. lbs.	tons. cwts. grs. lbs.	tons. cwts. grs. lbs.
August 1	(4·00tnks.)	..	13·25	..	3rd Crop. 0 5 3 2	..	0 8 2 2
3	(0·83 „)	..	..	2·75	0 6 0 5	..	0 5 0 3
4	(4·00 „)	..	13·25	..	0 5 0 4	..	0 9 0 4
5	(3·00 „)	..	..	9·94	0 1 1 21	..	0 5 2 23
6	(5·65 „)	..	18·71	..	0 4 2 11	..	0 6 2 23
7	(3·48 „)	..	..	11·53	0 3 2 26	..	0 5 3 1
8	(4·41 „)	..	..	14·61	0 7 1 24	4th Crop.	0 9 3 26
10	(2·88 „)	..	9·54	..	0 3 3 0	0 5 3 15	0 1 2 0
11	(3·20 „)	..	10·60	..	0 2 2 4	0 4 1 16	[4 2 22]
12	(1·00 „)	..	..	3·31	[2 0 1 13]	0 2 0 12	Total 4th Crop.
13	(2·62 „)	..	..	8·68	Total 3d Crop.	..	..
14	(2·60 „)	..	8·61	..		..	..
15	(3·25 „)	..	..	10·77		..	..
17	(2·30 „)	..	7·62	..		..	..
18	(1·00 „)	..	..	3·31		..	..
20	(5·64 „)	..	..	18·69		..	..
21	(3·40 „)	..	11·26	..		..	..
22	(3·30 „)	..	..	10·93		..	..
24	(3·15 „)	..	10·43	..		0 2 2 20	..
25	(1·55 „)	..	..	5·14		0 5 2 21	..
26	(3·56 „)	..	..	11·80		0 4 3 0	..
27	(5·46 „)	..	..	18·09		0 6 3 21	..
28	(5·40 „)	..	..	17·89		0 1 3 20	..
29	(4·81 „)	..	..	15·94		[1 14 1 13]	5th Crop.
31	(5·30 „)	..	17·55	..		Total 4th Crop.	0 8 1 12
Monthly Total		..	120·82	163·38	2 0 1 13	1 14 1 13	3 0 2 10
Sept. 1	(5·11tnks.)	..	..	16·93	..	..	0 4 0 17
2	(4·45 „)	..	..	14·75	..	..	0 4 3 1
3	(3·45 „)	..	11·42	..	..	..	0 5 0 21
4	(5·34 „)	..	..	17·70	..	..	0 5 3 11
5	(3·81 „)	..	..	12·63	..	5th Crop.	0 9 1 7
7	(4·40 „)	..	14·57	..	..	0 1 3 4	0 2 3 10
8	(2·86 „)	..	..	9·48	4th Crop.	0 1 2 24	[2 0 1 23]
9	(2·90 „)	..	..	9·61	0 2 1 19	..	Total 5th Crop.
10	(5·61 „)	..	..	18·59	0 4 0 8	..	
11	(2·31 „)	..	..	7·65	0 3 0 8	..	
12	(2·46 „)	..	8·15	..	[0 9 2 7]	..	..
15	(4·40 „)	..	..	14·58	Total 4th Crop.	..	..
16	(1·86 „)	..	..	6·16		..	..
17	(2·73 „)	..	9·04	..		..	..
18	(3·60 „)	..	..	11·93		..	..
19	(1·50 „)	..	4·97	..		..	..
21	(3·98 „)	..	..	13·19		..	..
22	(3·33 „)	..	..	11·03		0 4 2 14	..
23	(1·60 „)	..	5·30	..		0 4 2 10	..
24	(3·45 „)	..	..	11·43		0 0 2 10	..
25	(4·00 „)	..	..	13·25		[0 13 1 6]	..
26	(2·09 „)	..	6·62	..		Total 5th Crop.	..
28	(4·44 „)	..	..	14·71			..
29	(3·00 „)	..	..	9·94			..
30	(1·90 „)	..	..	6·30			..
Monthly Total		..	60·07	219·86	0 9 2 7	0 13 1 6	1 12 0 11

* When the *number of tanks* is given, the flow was too slow and irregular to estimate it by the average time taken to fill the gauge-tank, and therefor the actual number of tankfuls was counted.

TABLE V.—*continued.*

Detailed Record of the Sewage applied, and of the Amounts of Green Produce obtained in Experiments on Italian Rye-grass.

Season 1863.

DATES.	Average time * taken to fill Gauge-tank (3·308 tons).	Time of application.	Sewage applied (calculated per acre).		Green Grass obtained (calculated per acre).			
					Without Sewage.	With Sewage.		
			Plot 2. (Area 0·999 acre.)	Plot 3. (Area 0·99831 acre.)	Plot 1. (Area 1·00484 acre.)	Plot 2. (Area 0·999 acre.)	Plot 3. (Area 0·99831 acre.)	
		H. M.	Tons.	Tons.	*tons. cwts. qrs. lbs.*	*tons. cwts. qrs. lbs.*	*tons. cwts. qrs. lbs.*	
Oct. 1	(7·28tnks.)	..	24·11	..	..	..	..	
2	(2·50 „)	..	..	8·28	..	..	..	
3	(3·80 „)	..	12·58	..	..	..	..	
5	(4·32 „)	..	..	14·32	..	..	..	
6	(3·55 „)	..	..	11·76	..	..	..	
7	(1·87 „)	..	6·19	..	..	..	..	
8	(5·37 „)	..	..	17·79	..	..	..	
9	(7·16 „)	..	..	23·73	..	..	..	
10	(4·60 „)	..	15·23	..	..	..	..	
15	..	..	..	..	..	..	6th Crop. 0 17 2 3	
16	..	..	..	..	..	..	0 11 0 2	
17	..	..	..	..	..	6th Crop. 0 12 2 1	0 14 2 7	
21	..	..	..	..	..	0 13 1 15	[2 3 0 12]	
23	..	..	..	..	5th Crop. 0 6 0 9	[1 5 3 16]	Total 6th Crop.	
					Total 5th Crop.	Total 6th Crop.		
Monthly Total	..	..	58·11	75·88	0 6 0 9	1 5 3 16	2 3 0 12	

* When the *number of tanks* is given, the flow was too slow and irregular to estimate it by the average time taken to fill the gauge-tank, and therefore the actual number of tankfuls was counted.

Table VI.

Detailed Record of Food consumed, and Increase yielded, by Oxen fed on Unsewaged and Sewaged Meadow Grass, with Oilcake in addition.

Season 1862.

28 days, from May 8 to June 5.

Dates of weighing.	Two Oxen on Unsewaged Grass.							Eight Oxen on Sewaged Grass.						
	Particulars of the Food consumed.													
	Grass.						Oil-cake.†	Grass.						Oil-cake.†
	From			Quantities (weighed green).				From			Quantities (weighed green).			
	Field.	Plot.*	Crop.	tons.	cwts.	qrs.	lbs.	Field.	Plot.	Crop.	tons.	cwts.	qrs.	lbs.
1862,							lbs.							lbs.
May 8	Five-acre	00	1	0	1	2	11	6	Five-acre	4	1	0	8	0	15	24
9	,,	00	1	0	2	0	11	6	,,	4	1	0	8	2	14	24
10	,,	4	1	0	2	0	17	6	,,	4	1	0	9	2	9	24
11	,,	4	1	0	2	0	17	6	,,	4	1	0	9	2	9	24
12	,,	4	1	0	2	0	14	6	,,	4	1	0	11	1	11	24
13	,,	4	1	0	2	0	24	6	,,	4	1	0	9	3	0	24
14	,,	4	1	0	2	1	6	6	,,	4	1	0	9	3	22	24
15	,,	4	1	0	2	1	17	6	,,	4	1	0	10	1	6	24
16	,,	00	1	0	2	0	14	6	,,	4	1	0	11	2	1	24
17	,,	4	1	0	2	0	12	6	,,	4	1	0	10	2	21	24
18	,,	4	1	0	2	0	11	6	,,	4	1	0	10	2	21	24
19	,,	4	1	0	2	0	24	6	,,	4	1	0	12	0	27	24
20	,,	4	1	0	2	1	11	6	,,	4	1	0	10	1	8	24
21	,,	4	1	0	2	1	22	6	,,	4	1	0	10	3	15	24
22	,,	00	1	0	2	2	6	6	,,	3	1	0	9	3	6	24
23	,,	00	1	0	2	0	14	6	,,	3	1	0	9	0	7	24
24	,,	00	1	0	2	0	11	6	,,	3	1	0	10	3	10	24
25	,,	3	1	0	2	0	14	6	,,	3	1	0	10	3	9	24
26	,,	3	1	0	2	0	27	6	,,	3	1	0	11	1	15	24
27	,,	00	1	0	2	3	16	6	,,	3	1	0	10	2	1	24
28	,,	00	1	0	2	3	8	6	,,	3	1	0	9	2	26	24
29	,,	0	1	0	2	0	4	6	,,	3	1	0	8	2	13	24
30	,,	0	1	0	2	1	0	6	,,	3	1	0	9	0	23	24
31	,,	0	1	0	2	0	18	6	,,	3	1	0	8	3	22	24
June 1	,,	0	1	0	2	0	20	6	,,	3	1	0	8	3	22	24
2	,,	0	1	0	2	1	13	6	,,	3	1	0	9	3	1	24
3	,,	0	1	0	2	2	16	6	,,	3	1	0	8	0	14	24
4	,,	0	1	0	2	1	1	6	,,	3	1	0	9	0	7	24
Total in 28 days - - -				3	3	0	15	168	Total in 28 days - -			13	18	1	19	672
Average per head per day -				0	1	0	14	3	Average per head per day			0	1	0	27	3

Weights and Increase of the Oxen, &c.

Nos.	Weights.‡		Increase in 28 days.	Per 1,000 lbs. live-weight per week.			Weights.		Increase in 28 days.	Per 1,000 lbs. live-weight per week.		
				Food consumed.		Increase in weight.				Food consumed.		Increase in weight.
	May 8.	June 5.		Grass.	Oilcake.		May 8.	June 5.		Grass.	Oilcake.	
	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.
1	1,129	1,234	105	} 745	17¾	23·9	1,230	1,318	88	} 836	18	24·4
2	1,130	1,252	122				1,141	1,232	91			
3	..	..	..	..	..	..	1,073	1,186	113			
4	..	..	..	..	..	..	1,168	1,316	148			
5	..	..	..	..	..	..	1,136	1,252	116			
6	..	..	..	..	..	..	1,066	1,170	104			
7	..	..	..	..	..	..	1,050	1,152	102			
8	..	..	..	..	..	..	1,005	1,152	147			
Totals	2,259	2,486	227	..	..	..	8,869	9,778	909	..	..	..
Means	1,130	1,243	113	..	..	..	1,109	1,222	114	..	..	..

* Plot "0" is unmeasured land without sewage, and Plot "00" unmeasured land with sewage.
† Equal parts linseed cake and rape cake.
‡ Until May 29th, the two oxen received sewaged grass, the unsewaged not being ready for cutting until hat date, at which time the animals weighed 1,225 lbs. and 1,255 lbs. respectively.

TABLE VI.—*continued.*

Detailed Record of Food consumed, and Increase yielded, by Oxen fed on Unsewaged and Sewaged Meadow Grass, with Oilcake in addition.

Season 1862.

28 days, from June 5 to July 3.

Dates of weighing.	Two Oxen on Unsewaged Grass.								Eight Oxen on Sewaged Grass.							
	Particulars of the Food consumed.															
	Grass							Oil-cake.†	Grass							Oil-cake.†
	From			Quantities (weighed green).					From			Quantities (weighed green).				
	Field.	Plot.*	Crop.	tons.	cwts.	qrs.	lbs.	lbs.	Field.	Plot.*	Crop.	tons.	cwts.	qrs.	lbs.	lbs.
1862.																
June 5	Five-acre	0	1	0	2	0	2	6	Five-acre	3	1	0	7	3	25	24
6	,,	0	1	0	1	3	5	6	,,	4	1	0	9	1	21	24
7	,,	0	1	0	1	3	26	6	,,	4	1	0	7	3	0	24
8	,,	0	1	0	2	0	0	6	,,	4	1	0	7	3	0	24
9	,,	0	1	0	2	0	1	6	,,	4	1	0	7	3	22	24
10	,,	0	1	0	2	0	20	6	,,	4	1	0	10	3	0	24
11	,,	0	1	0	2	1	9	6	,,	4	1	0	8	1	13	24
12	,,	0	1	0	2	1	12	6	,,	4	1	0	9	2	27	24
13	,,	0	1	0	2	1	9	6	,,	4	1	0	9	3	3	24
14	,,	0	1	0	1	3	11	6	,,	4	1	0	6	3	2	24
15	,,	0	1	0	1	3	18	6	,,	4	1	0	6	3	4	24
16	,,	0	1	0	2	2	7	6	,,	4	1	0	8	2	20	24
17	,,	0	1	0	2	1	11	6	,,	4	1	0	8	1	25	24
18	,,	0	1	0	2	1	1	6	,,	4	1	0	8	1	17	24
19	,,	0	1	0	2	0	9	6	,,	3	1	0	7	3	23	24
20	,,	0	1	0	2	0	23	6	,,	3	1	0	8	2	25	24
21	,,	0	1	0	2	0	2	6	,,	3	1	0	7	1	27	24
22	,,	0	1	0	2	0	4	6	,,	3	1	0	7	2	4	24
23	,,	0	1	0	2	0	1	6	,,	3	1	0	5	3	12	24
24	,,	0	1	0	2	0	2	6	,,	2	1	0	11	0	9	24
25	,,	0	1	0	1	2	14	6	,,	2	1	0	8	0	5	24
26	,,	0	1	0	1	3	9	6	,,	2	1	0	7	1	14	24
27	,,	0	1	0	2	0	8	6	,,	00	1	0	6	3	18	24
28	,,	1	1	0	2	0	1	6	,,	2	1	0	6	3	8	24
29	,,	1	1	0	2	0	0	6	,,	2	1	0	6	3	14	24
30	,,	1	1	0	2	1	5	6	,,	2	1	0	7	3	8	24
July 1	,,	1	1	0	1	3	14	6	,,	2	1	0	8	2	4	24
2	,,	1	1	0	1	3	24	6	,,	2	1	0	7	1	22	24
Total in 28 Days	-	-		2	17	3	19	168	Total in 28 days	-	-	11	7	0	3	672
Average per head per day	-			0	1	0	4	3	Average per head per day			0	1	0	2	3

WEIGHTS AND INCREASE OF THE OXEN, &c.

Nos.	Weights.		Increase in 28 days.	Per 1,000 lbs. live-weight per week.			Weights.		Increase in 28 days.	Per 1,000 lbs. live-weight per week.		
				Food consumed.		Increase in weight.				Food consumed.		Increase in weight.
	June 5.	July 3.		Grass.	Oilcake.		June 5.	July 3.		Grass.	Oilcake.	
	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.
1	1,234	1,276	42	636	16¼	12·6	1,318	1,402	84	629	16¼	15·9
2	1,252	1,338	86				1,232	1,330	98			
3	..	..	..	..	..	..	1,186	1,290	104			
4	..	..	..	..	..	..	1,316	1,390	74			
5	..	..	..	..	..	..	1,252	1,328	76			
6	..	..	..	..	..	..	1,170	1,220	50			
7	..	..	..	..	..	..	1,152	1,205	53			
8	..	..	..	..	..	..	1,152	1,256	104			
Totals	2,486	2,614	128	..	..	..	9,778	10,421	643	..	..	..
Means	1,243	1,307	64	..	..	..	1,222	1,302	80	..	..	..

* Plot "0" is unmeasured land without sewage, and Plot "00" unmeasured land with sewage.
† Equal parts linseed cake and rape cake.

Table VI.—*continued.*

Detailed Record of Food consumed, and Increase yielded, by Oxen fed on Unsewaged and Sewaged Meadow Grass, with Oilcake in addition.

Season 1862.

28 days, from July 3 to July 31.

Dates of weighing.	Two Oxen on Unsewaged Grass.					Eight Oxen on Sewaged Grass.				
	Particulars of the Food consumed.									
	Grass.				Oil-cake.†	Grass.				Oil-cake.†
	From			Quantities (weighed green).		From			Quantities (weighed green).	
	Field.	Plot.*	Crop.			Field.	Plot.*	Crop.		
1862.				*tons. cwts. qrs. lbs.*	*lbs.*				*tons. cwts. qrs. lbs.*	*lbs.*
July 3	Five-acre	1	1	0 1 3 4	6	Five-acre	2	1	0 7 2 15	24
4	,,	0	1	0 1 3 9	6	,,	00 & 2	1	0 8 0 18	24
5	,,	1	1	0 2 0 18	6	,,	2	1	0 7 1 8	24
6	,,	1	1	0 2 0 20	6	,,	2	1	0 7 1 13	24
7	,,	1	1	0 2 0 13	6	,,	2	1	0 8 0 21	24
8	,,	1	1	0 2 0 8	6	,,	00, 2 & 4	1 & 2	0 8 1 18	24
9	,,	1	1	0 2 0 19	6	,,	2	1	0 8 2 10	24
10	,,	1	1	0 1 3 6	6	,,	2	1	0 6 2 27	24
11	,,	1	1	0 2 0 15	6	,,	2	1	0 6 3 10	24
12	,,	1	1	0 2 1 9	6	,,	2	1	0 8 1 16	24
13	,,	1	1	0 2 1 8	6	,,	2	1	0 8 1 16	24
14	,,	1	1	0 2 1 0	6	,,	2	1	0 7 3 15	24
15	,,	1	1	0 1 3 15	6	,,	2	1	0 7 2 21	24
16	,,	1	1	0 1 3 14	6	,,	2	1	0 5 3 17	24
17	,,	1	1	0 1 3 11	6	,,	2	1	0 6 2 5	24
18	,,	1	1	0 1 3 21	6	,,	2	1	0 8 0 10	24
19	,,	1	1	0 1 3 10	6	,,	2	1	0 5 3 9	24
20	,,	1	1	0 1 3 14	6	,,	2	1	0 5 3 9	24
21	,,	1	1	0 1 3 10	6	,,	2	1	0 5 2 17	24
22	,,	1	1	0 1 3 4	6	,,	2	1	0 5 1 16	24
23	,,	1	1	0 1 3 4	6	,,	4	2	0 8 1 5	24
24	,,	1	1	0 2 0 9	6	,,	4	2	0 8 0 14	24
25	,,	1	1	0 1 3 8	6	,,	4	2	0 9 2 25	24
26	,,	1	1	0 1 3 11	6	,,	4	2	0 7 2 0	24
27	,,	1	1	0 1 3 14	6	,,	4	2	0 7 2 0	24
28	,,	1	1	0 1 3 19	6	,,	4	2	0 8 3 11	24
29	,,	1	1	0 1 2 5	6	,,	4	2	0 8 1 24	24
30	,,	1	1	0 1 2 2	6	,,	4	2	0 8 0 12	24
Total in 28 days				2 14 1 20	168	Total in 28 days			10 9 1 18	672
Average per head per day				0 0 3 25	3	Average per head per day			0 0 3 21	3

Weights and Increase of the Oxen, &c.

Nos.	Weights.		Increase in 28 days.	Per 1,000 lbs. live-weight per week.			Weights.		Increase (or loss) in 28 days.	Per 1,000 lbs. live-weight per week.		
				Food consumed.		Increase in weight.				Food consumed.		Increase in weight.
	July 3.	July 31.		Grass.	Oilcake.		July 3.	July 31.		Grass.	Oilcake.	
	lbs.	*lbs.*	*lbs.*	*lbs.*	*lbs.*	*lbs.*	*lbs.*	*lbs.*	*lbs.*	*lbs.*	*lbs.*	*lbs.*
1	1,276	1,332	56	570	15¼	11·0	1,402	1,426	24	556	16	5·6
2	1,338	1,400	62				1,330	1,328	− 2			
3	..	..	..	..	..	..	1,290	1,288	− 2			
4	..	..	..	..	..	..	1,390	1,448	58			
5	..	..	..	..	..	..	1,328	1,372	44			
6	..	..	..	..	..	..	1,220	1,266	46			
7	..	..	..	..	..	..	1,205	1,242	37			
8	..	..	..	..	..	..	1,256	1,286	30			
Totals	2,614	2,732	118	..	..	..	10,421	10,656	235	..	..	..
Means	1,307	1,366	59	..	..	..	1,303	1,332	29	..	..	..

* Plot "0" is unmeasured land without sewage, and Plot "00" unmeasured land with sewage.
† Equal parts linseed cake and rape cake.

TABLE VI.—*continued.*

Detailed Record of Food consumed, and Increase yielded, by Oxen fed on Unsewaged and Sewaged Meadow Grass, with Oilcake in addition.

Season 1862.

28 days, from July 31 to August 28.

Dates of weighing.	Two Oxen on Unsewaged Grass. Particulars of the Food consumed. Grass: From Field.	Plot.*	Crop.	Quantities (weighed green): tons.	cwts.	qrs.	lbs.	Oil-cake.† lbs.	Eight Oxen on Sewaged Grass. Particulars of the Food consumed. Grass: From Field.	Plot.	Crop.	Quantities (weighed green): tons.	cwts.	qrs.	lbs.	Oil-cake.† lbs.
July 31	Five-acre	1	1	0	1	1	20	6	Five-acre	4	2	0	6	2	3	24
Aug. 1	,,	1	1	0	1	2	13	6	,,	4	2	0	8	0	27	24
2	,,	1	1	0	1	1	7	6	,,	4	2	0	10	0	16	24
3	,,	1	1	0	1	1	6	6	,,	3	2	0	9	0	8	24
4	,,	1	1	0	1	1	9	6	,,	3	2	0	8	0	18	24
5	,,	1	1	0	1	2	4	6	,,	3	2	0	8	2	15	24
6	,,	1	1	0	1	3	5	6	,,	3	2	0	9	3	20	24
7	,,	1	1	0	1	2	12	6	,,	3	2	0	11	2	8	24
8	,,	1	1	0	1	1	21	6	,,	3	2	0	9	0	22	24
9	,,	1	1	0	1	3	1	6	,,	3	2	0	9	0	6	24
10	,,	1	1	0	1	3	0	6	,,	3	2	0	9	0	6	24
11	,,	1	1	0	1	1	27	6	,,	3	2	0	8	2	16	24
12	,,	1	1	0	1	0	17	6	,,	3	2	0	8	3	13	24
13	,,	1	1	0	1	1	9	6	,,	3	2	0	8	3	2	24
14	,,	1	1	0	2	1	3	6	,,	3	2	0	11	2	7	24
15	,,	1	1	0	1	2	0	6	,,	3	2	0	8	1	13	24
16	,,	1	1	0	1	0	21	6	,,	3	2	0	8	1	26	24
17	,,	1	1	0	1	0	23	6	,,	3	2	0	8	2	0	24
18	,,	1	1	0	1	3	3	6	,,	3	2	0	11	0	25	24
19	,,	1	1	0	1	2	1	6	,,	3	2	0	9	0	21	24
20	,,	1	1	0	1	2	3	6	,,	3	2	0	9	1	20	24
21	,,	0	1	0	1	0	19	6	,,	3	2	0	7	2	21	24
22	,,	0	1	0	1	1	7	6	,,	2	2	0	9	3	22	24
23	,,	0	1	0	1	0	9	6	,,	2	2	0	9	1	18	24
24	,,	0	1	0	1	0	12	6	,,	2	2	0	9	1	23	24
25	,,	0	1	0	1	0	5	6	,,	2	2	0	8	1	14	24
26	,,	0	1	0	1	0	6	6	,,	2	2	0	9	2	9	24
27	,,	0	1	0	1	0	2	6	,,	2	2	0	10	0	13	24
Total in 28 days		-	-	1	19	2	13	168	Total in 28 days	-	-	12	17	0	20	672
Average per head per day		-		0	0	2	23	3	Average per head per day			0	1	0	17	3

WEIGHTS AND INCREASE OF THE OXEN, &c.

Nos.	Weights. July 31.	Aug. 28.	Increase in 28 days.	Per 1,000 lbs. live-weight per week. Food consumed. Grass.	Oilcake.	Increase in weight.	Weights. July 31.	Aug. 28.	Increase (or loss) in 28 days.	Per 1,000 lbs. live-weight per week. Food consumed. Grass.	Oilcake.	Increase (or loss) in weight.
	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.
1	1,332	1,374	42	399	15	9·0	1,426	1,420	− 6			
2	1,400	1,458	58				1,328	1,272	−56			
3	..	..	..	..	..	..	1,288	1,290	2			
4	..	..	..	..	..	..	1,448	1,458	10	677	15½	−1·1
5	..	..	..	..	..	..	1,372	1,386	14			
6	..	..	..	..	..	..	1,266	1,273	7			
7	..	..	..	..	..	..	1,242	1,240	− 2			
8	..	..	..	..	..	..	1,286	1,272	−14			
Totals	2,732	2,832	100	..	..	..	10,656	10,611	−45	..	..	..
Means	1,366	1,416	50	..	..	..	1,332	1,326	− 6	..	..	..

* Plot "0" is unmeasured land without sewage.

† Equal parts linseed cake and rape cake.

Table VI.—*continued.*

Detailed Record of Food consumed, and Increase yielded, by Oxen fed on Unsewaged and Sewaged Meadow Grass, with Oilcake in addition.

Season 1862.

28 days, from August 28 to September 25.

Dates of weighing.	Two Oxen on Unsewaged Grass.							Eight Oxen on Sewaged Grass.						
	Particulars of the Food consumed.													
	Grass.						Oil-cake.†	Grass.						Oil-cake.†
	From			Quantities (weighed green).				From			Quantities (weighed green).			
	Field.	Plot.*	Crop.	*tons.*	*cwts.*	*qrs.*	*lbs.*	Field.	Plot.*	Crop.	*tons.*	*cwts.*	*qrs.*	*lbs.*
1862.							*lbs.*							*lbs.*
Aug. 28	Five-acre	0	1	0	0	3	25	8	Five-acre	2	2	0	9	0	20	32
29	,,	0	1	0	1	0	8	8	,,	2	2	0	8	2	15	32
30	,,	0	2	0	1	3	3	8	,,	2	2	0	9	2	25	32
31	,,	0	2	0	1	3	5	8	,,	2	2	0	9	3	2	32
Sept. 1	,,	0	2	0	1	3	3	8	,,	00 & 2	2	0	11	3	13	32
2	,,	0	2	0	1	3	8	8	,,	2	2	0	10	2	20	32
3	,,	0	2	0	1	3	13	8	,,	2	2	0	10	3	0	32
4	,,	0	2	0	1	3	16	8	,,	2	2	0	9	3	25	32
5	,,	0	2	0	1	3	15	8	,,	2	2	0	9	3	26	32
6	,,	0	2	0	1	3	8	8	,,	2	2	0	9	3	0	32
7	,,	0	2	0	1	3	10	8	,,	2	2	0	9	3	3	32
8	,,	0	2	0	1	3	1	8	,,	2	2	0	7	0	20	32
9	,,	0	2	0	1	3	12	8	,,	00	2	0	9	0	9	32
10	,,	0	2	0	1	3	15	8	,,	00	2	0	9	0	26	32
11	,,	0	2	0	1	3	17	8	,,	00 & 4	2 & 3	0	9	1	3	32
12	,,	0	2	0	1	3	18	8	,,	4	3	0	10	0	15	32
13	,,	0	2	0	1	3	2	8	,,	4	3	0	8	3	22	32
14	,,	0	2	0	1	3	1	8	,,	4	3	0	8	3	10	32
15	,,	0	2	0	1	2	23	8	,,	4	3	0	11	0	3	32
16	,,	0	2	0	1	2	20	8	,,	4	3	0	10	1	11	32
17	,,	0	2	0	1	2	15	8	,,	4	3	0	11	1	4	32
18	,,	0	2	0	1	3	2	10	,,	4	3	0	11	2	15	40
19	,,	0	2	0	1	2	13	10	,,	4	3	0	10	3	15	40
20	,,	0	2	0	1	3	3	10	,,	4	3	0	8	3	19	40
21	,,	0	2	0	1	3	6	10	,,	4	3	0	8	3	19	40
22	,,	0	2	0	1	3	7	10	,,	4	3	0	9	3	17	40
23	,,	0	2	0	1	3	16	10	,,	4	3	0	8	3	10	40
24	,,	0	2	0	1	2	21	10	,,	4	3	0	10	0	1	40
Total in 28 days - -				2	8	2	26	238	Total in 28 days - -			13	14	2	4	952
Average per head per day -				0	0	3	13	4¼	Average per head per day			0	1	0	25	4¼

Weights and Increase of the Oxen, &c.

Nos.	Weights.		Increase (or loss) in 28 days.	Per 1,000 lbs. live-weight per week.			Weights.		Increase in 28 days.	Per 1,000 lbs. live-weight per week.		
				Food consumed.		Increase in weight.				Food consumed.		Increase in weight.
	Aug. 28.	Sep. 25.‡		Grass.	Oilcake.		Aug. 28.	Sep. 25.‡		Grass.	Oilcake.	
	lbs.	*lbs.*	*lbs.*	*lbs.*	*lbs.*	*lbs.*	*lbs.*	*lbs.*	*lbs.*	*lbs.*	*lbs.*	*lbs.*
1	1,374	1,414	40	479	20¾	3·3	1,420	1,508	88			
2	1,458	1,456	—2				1,272	1,425	153			
3	..	..	..	..	..	..	1,290	1,408	118			
4	..	..	..	..	..	..	1,458	1,524	66	700	21¾	16·7
5	..	..	..	..	..	..	1,386	1,468	82			
6	..	..	..	..	..	..	1,273	1,334	61			
7	..	..	..	..	..	..	1,240	1,310	70			
8	..	..	..	..	..	..	1,272	1,369	97			
Totals	2,832	2,870	38	..	..	..	10,611	11,346	735	..	..	..
Means	1,416	1,435	19	..	..	..	1,326	1,418	92	..	..	..

* Plot "0" is unmeasured land without sewage, and Plot "00" unmeasured land with sewage.

† Linseed cake only, excepting on August 28 and 29, on which days a mixture of linseed cake and rape cake was given.

‡ These weights were in fact, for convenience, taken on September 26, but in the calculations are supposed to apply to September 25.

Table VI.—*continued.*

Detailed Record of Food consumed, and Increase yielded, by Oxen fed on Unsewaged and Sewaged Meadow Grass, with Oilcake in addition.

Season 1862.

18 days, from September 25 to October 13.

Dates of weighing.	Two Oxen on Unsewaged Grass. Particulars of the Food consumed. Grass. From Field.	Plot.*	Crop.	Quantities (weighed green). tons.	cwts.	qrs.	lbs.	Oil-cake.† lbs.	Eight Oxen on Sewaged Grass. Particulars of the Food consumed. Grass. From Field	Plot.*	Crop.	Quantities (weighed green). tons.	cwts.	qrs.	lbs.	Oil-cake.† lbs.
1862.																
Sept. 25	Five-acre	0	2	0	1	3	24	12	Five-acre	4	3	0	11	1	2	48
26	,,	0	2	0	1	3	3	12	,,	4	3	0	9	3	3	48
27	,,	0	2	0	1	2	19	12	,,	4	3	0	8	3	21	48
28	,,	0	2	0	1	2	21	12	,,	4	3	0	8	3	26	48
29	,,	0	2	0	1	3	23	12	,,	4	3	0	10	1	6	48
30	,,	0	2	0	1	3	20	12	,,	4	3	0	10	0	1	48
Oct. 1	,,	0	2	0	1	3	23	12	,,	3	3	0	13	0	16	48
2	,,	0	2	0	2	0	6	12	,,	3	3	0	9	2	23	48
3	,,	0	2	0	1	3	3	12	,,	2 & 3	3	0	12	0	11	48
4	,,	1	2	0	1	3	17	12	,,	2	3	0	8	3	5	48
5	,,	1	2	0	1	3	20	12	,,	2	3	0	8	3	10	48
6	,,	1	2	0	1	3	11	12	,,	00 & 2	2 & 3	0	10	0	8	48
7	,,	1	2	0	1	3	8	12	,,	2	3	0	11	0	11	48
8	,,	1	2	0	1	3	9	12	,,	2	3	0	9	0	22	48
9	,,	1	2	0	1	3	9	12	,,	2	3	0	9	1	3	48
10	,,	1	2	0	1	3	24	12	,,	2	3	0	9	1	11	48
11	,,	1	2	0	1	3	6	12	,, ‡	2	3	0	7	2	16	48
12	,,	1	2	0	1	3	8	12	,, ‡	..	..	0	7	2	16	48
13	Five-acre	1	2	0	1	3	7	16	Five-acre‡	00	3	0	11	0	13	64
14	,,	1	2	0	1	3	14	16	,,	4	4	0	9	2	7	64
15	,,	1	2	0	1	3	8	16	,,	4	4	0	8	2	2	64
16	,,	1	2	0	1	3	11	16	,,	4	4	0	8	3	23	64
Total in 18 days (to Oct. 13)				1	13	2	2	216	Total in 18 days (to Oct. 13)			8	16	0	15	864
Average per head per day				0	0	3	20	6	Average per head per day			0	1	0	25	6

Weights and Increase of the Oxen, &c.

Nos.	Weights. Sept. 25. § lbs.	Oct. 13. lbs.	Increase (or loss) in 18 days. lbs.	Per 1,000 lbs. live-weight per week. Food consumed. Grass. lbs.	Oilcake. lbs.	Increase (or loss) in weight. lbs.	Weights. Sept. 25. § lbs.	Oct. 13. lbs.	Increase (or loss) in 18 days. lbs.	Per 1,000 lbs. live-weight per week. Food consumed. Grass. lbs.	Oilcake. lbs.	Increase (or loss) in weight. lbs.
1	1,414	1,356	−58	515	29¾	−10·3	1,508	1,483	−20	681	29¾	−5·6
2	1,456	1,439	−17				1,425	1,378	−47			
3	..	..	..	..	..	..	1,403	1,414	6			
4	..	..	..	..	..	..	1,524	1,531	7			
5	..	..	..	..	..	..	1,468	1,442	−26			
6	..	..	..	..	..	..	1,334	1,232	− 2			
7	..	..	..	..	..	..	1,310	1,288	−22			
8	..	..	..	..	..	..	1,369	1,311	−58			
Totals	2,870	2,795	−75	..	..	..	11,346	11,184	−162	..	..	..
Means	1,435	1,397	−38	..	..	..	1,418	1,398	−20	..	..	..

* Plot "0" is unmeasured land without sewage, and plot "00" unmeasured land with sewage.
† Linseed cake.
‡ On October 11, 2 cwts. 0 qrs. 12 lbs., on October 12, the whole quantity, viz. 7 cwts. 2 qrs. 16 lbs., and on October 13, 8 cwts. 2 qrs. 23 lbs. of the grass came from another (not experimental) field.
§ These weights were in fact, for convenience, taken on September 26, but in the calculations are supposed to apply to September 25.

Table VII.

Summary of the Weights and Increase of the Oxen fed respectively on Unsewaged and Sewaged Meadow Grass, with Oilcake in addition.

Season 1862.

—	Weights.								Increase in Weight.					
									May 8 to Oct. 13 = 22⅔ weeks.‡			June 5 to Oct. 13 = 18⅓ weeks.§		
	May 8.*	May 29.*	June 5.	July 3.	July 31.	Aug. 28.	Sept. 25.†	Oct. 13.	Total.	Per head per week.	Per 1,000 lbs. live-weight per week.	Total.	Per head per week.	Per 1,000 lbs. live-weight per week.
Two Oxen on Unsewaged Grass.														
	lbs.	*lbs.*	*lbs.*	*lbs.*	*lbs.*	*lbs.*	*lbs.*	*lbs.*	*lbs.*	*lbs. ozs.*	*lbs. ozs.*	*lbs.*	*lbs. ozs.*	*lbs. ozs.*
1	1,129	1,225	1,234	1,276	1,332	1,374	1,414	1,356	227	10 1	8 2	122	6 9	5 1
2	1,130	1,255	1,252	1,338	1,400	1,458	1,456	1,439	309	13 11	10 11	187	10 1	7 8
Totals - -	2,259	2,480	2,486	2,614	2,732	2,832	2,870	2,795	536	—	—	309	—	—
Averages -	1,130	1,240	1,243	1,307	1,366	1,416	1,435	1,398	268	11 14	9 6	155	8 5	6 5
Eight Oxen on Sewaged Grass.														
1	1,230	—	1,318	1,402	1,426	1,420	1,508	1,488	258	11 7	8 7	170	9 2	6 8
2	1,141	—	1,232	1,330	1,328	1,272	1,425	1,378	237	10 8	8 5	146	7 14	6 0
3	1,073	—	1,186	1,290	1,288	1,290	1,408	1,414	341	15 2	12 2	228	12 4	9 7
4	1,168	—	1,316	1,390	1,448	1,458	1,524	1,531	363	16 1	11 14	215	11 9	8 2
5	1,136	—	1,252	1,328	1,372	1,386	1,468	1,442	306	13 9	10 8	190	10 4	7 10
6	1,066	—	1,170	1,220	1,266	1,273	1,334	1,332	266	11 13	9 13	162	8 12	7 0
7	1,050	—	1,152	1,205	1,242	1,240	1,310	1,288	238	10 9	9 0	136	7 5	6 0
8	1,005	—	1,152	1,256	1,286	1,272	1,369	1,311	306	13 9	11 11	159	8 9	6 15
Totals - -	8,869	—	9,778	10,421	10,656	10,611	11,346	11,184	2,315	—	—	1,406	—	—
Averages -	1,109	—	1,222	1,303	1,332	1,326	1,418	1,398	289	12 13	10 4	176	9 7	7 4

* Both lots of animals were weighed on May 8, but as the unsewaged grass was not ready to cut until May 29, the 2 animals were then re-weighed.
† Sept. 25 was the proper day of weighing, but as a matter of convenience, it did not, in fact, take place until Sept. 26.
‡ This period includes the first 3 weeks during which the 2 oxen, otherwise fed on unsewaged grass, received sewaged grass.
§ This period excludes the first month of the experiment during 3 weeks of which the 2 oxen, otherwise fed on unsewaged grass, received sewaged grass.

Table VIII.

Summary of Food consumed and Increase yielded by the Oxen fed on Unsewaged and Sewaged Meadow Grass, with Oilcake in addition.

Season 1862.

Periods.		Two Oxen on Unsewaged Grass.						Eight Oxen on Sewaged Grass.					
		Food consumed.				Increase (or Loss) in Weight.		Food consumed.				Increase (or Loss) in Weight.	
Dates.	Number of Weeks.	Per head per week.		Per 1,000 lbs. live-weight per week.		Per head per week.	Per 1000 lbs. live-weight per week.	Per head per week.		Per 1,000 lbs. live-weight per week.		Per head per week.	Per 1,000 lbs. live-weight per week.
		Grass.	Oilcake.	Grass.	Oilcake.			Grass.	Oilcake.	Grass.	Oilcake.		
		lbs.	*lbs.*	*lbs.*	*lbs.*	*lbs. ozs.*	*lbs. ozs.*	*lbs.*	*lbs.*	*lbs.*	*lbs.*	*lbs. ozs.*	*lbs. ozs.*
May 8 to June 5	4	884	21	745	17¾	28 6	23 15	974	21	836	18	28 6	24 6
June 5 to July 3	4	811	21	636	16½	16 0	12 9	795	21	629	16¾	20 2	15 15
July 3 to July 31	4	762	21	570	15¾	14 12	11 1	733	21	556	16	7 6	5 9
July 31 to Aug. 28	4	555	21	399	15	12 8	9 0	900	21	677	15¾	−1 6	−1 1
Aug. 28 to Sept 25	4	682	29¾	479	20¾	4 12	3 5	961	29¾	700	21¾	23 0	16 12
Sept. 25 to Oct. 13	2⅘	730	42	515	29¾	−14 9	−10 5	959	42	681	29¾	−7 14	−5 9
May 8 to Oct. 13 *	22⅘	738	25	584	19¾	11 14	9 6	882	25	704	20	12 13	10 4
June 5 to Oct 13 †	18⅘	706	25¾	535	19½	8 5	6 5	863	25¾	658	19¾	9 7	7 4

* This period includes the first 3 weeks during which the 2 oxen, otherwise fed on unsewaged grass, received sewaged grass.
† This period excludes the first month of the experiment during 3 weeks of which the 2 oxen, otherwise fed on unsewaged grass, received sewaged grass.

Table IX.

Detailed Record of Food consumed, and Milk yielded, by Cows fed on the Unsewaged and Sewaged Meadow Grass, with Oilcake in addition.

Second Season, 1862 ; 7 days.—May 2 to May 8.

Three Cows.—Unsewaged Grass.

Food consumed.		Friday.	Saturday.	Sunday.	Monday.	Tuesday.	Wednesday.	Thursday.	Total in 7 days.	Per head per day.
Grass	From which Field, Plot, and Crop.	*	*	*	*	*	*	*	—	—
	Quantities weighed	tons. cwts. qrs. lbs. 0 3 1 0	tons. cwts. qrs. lbs. 0 4 0 6	tons. cwts. qrs. lbs. 0 4 2 14	tons. cwts. qrs. lbs. 0 4 2 14	tons. cwts. qrs. lbs. 0 4 0 0	tons. cwts. qrs. lbs. 0 4 0 4	tons. cwts. qrs. lbs. 0 4 0 0	tons. cwts. qrs. lbs. 0 1 1 12	tons. cwts. qrs. lbs. 0 1 1 12
Oilcake (equal parts linseed and rape cake)		0 0 0 9	0 0 0 9	0 0 0 9	0 0 0 9	0 0 0 9	0 0 0 9	0 0 0 9	0 0 2 7	0 0 0 3

Yield of Milk, &c.	Cows. Nos.	Breed.	Years old.	Dates of Calving.	Weights (May 1). lbs.	Friday. A.M. lbs. ozs.	Friday. P.M. lbs. ozs.	Saturday. A.M. lbs. ozs.	Saturday. P.M. lbs. ozs.	Sunday. A.M. lbs. ozs.	Sunday. P.M. lbs. ozs.	Monday. A.M. lbs. ozs.	Monday. P.M. lbs. ozs.	Tuesday. A.M. lbs. ozs.	Tuesday. P.M. lbs. ozs.	Wednesday. A.M. lbs. ozs.	Wednesday. P.M. lbs. ozs.	Thursday. A.M. lbs. ozs.	Thursday. P.M. lbs. ozs.	Total in 7 days. lbs. ozs.	Per head per day. lbs. ozs.
	1	Cross Sht.-horn	6	Mar. 20	945	14 6	12 8	13 4	11 4	20 0	11 14	12 5	14 10	22 0	14 10	20 8	14 10	22 0	17 7	229 1	32 12
	2	Cross Sht.-horn	7	Dec. 25	976	13 12	12 8	13 2	13 2	18 12	12 8	16 14	11 14	13 0	10 14	16 2	12 3	15 10	13 4	193 9	27 10
	3	Cross Sht.-horn	Aged	Feb. 26	884	16 14	15 10	19 6	15 0	18 12	15 0	20 0	13 12	20 2	14 11	21 12	15 13	19 6	15 0	241 2	34 7
				Totals -	2,805	45 0	40 10	48 12	39 6	57 8	39 6	58 3	40 4	53 2	37 14	58 6	42 10	57 0	45 11	663 12	—
				Means -	935	15 0	13 9	16 4	13 2	19 3	13 2	19 6	13 7	17 11	12 10	19 7	14 3	19 0	15 4	221 4	31 10

Twelve Cows.—Sewaged Grass.

Food consumed.		Friday.	Saturday.	Sunday.	Monday.	Tuesday.	Wednesday.	Thursday.	Total in 7 days.	Per head per day.
Grass	From which Field, Plot, and Crop.	Ten-acre, Plot 4, Crop 1.	Ten-acre, Plot 4, Crop 1.	Ten-acre, Plot 4, Crop 1.	Ten-acre, Plot 4, Crop 1.	Ten-acre, Plot 4, Crop 1.	Ten-acre, Plot 4, Crop 1.	Ten-acre, Plot 3, Crop 1.	—	—
	Quantities weighed	tons. cwts. qrs. lbs. 0 13 1 23	tons. cwts. qrs. lbs. 0 12 3 23	tons. cwts. qrs. lbs. 0 10 3 23	tons. cwts. qrs. lbs. 0 11 0 0	tons. cwts. qrs. lbs. 0 17 1 23	tons. cwts. qrs. lbs. 0 17 2 23	tons. cwts. qrs. lbs. 0 16 0 14	tons. cwts. qrs. lbs. 4 19 2 17	tons. cwts. qrs. lbs. 0 1 0 21
Oilcake (equal parts linseed and rape cake)		0 0 1 8	0 0 1 8	0 0 1 8	0 0 1 8	0 0 1 8	0 0 1 8	0 0 1 8	0 2 1 0	0 0 0 3

Yield of Milk, &c.	Cows. Nos.	Breed.	Years old.	Dates of Calving.	Weights (May 1). lbs.	Friday. A.M. lbs. ozs.	Friday. P.M. lbs. ozs.	Saturday. A.M. lbs. ozs.	Saturday. P.M. lbs. ozs.	Sunday. A.M. lbs. ozs.	Sunday. P.M. lbs. ozs.	Monday. A.M. lbs. ozs.	Monday. P.M. lbs. ozs.	Tuesday. A.M. lbs. ozs.	Tuesday. P.M. lbs. ozs.	Wednesday. A.M. lbs. ozs.	Wednesday. P.M. lbs. ozs.	Thursday. A.M. lbs. ozs.	Thursday. P.M. lbs. ozs.	Total in 7 days. lbs. ozs.	Per head per day. lbs. ozs.
	1	Cross Sht.-horn	6	Nov. 18	1,143	12 8	8 2	12 8	10 0	15 0	10 0	13 8	10 1	13 1	9 8	13 14	10 6	13 10	13 0	165 2	23 9
	2	Cross Sht.-horn	8	Feb. 2	1,138	12 8	10 10	13 2	10 10	18 2	10 10	15 10	11 1	15 1	11 0	14 15	9 6	15 12	11 0	179 7	25 10
	3	Cross Sht.-horn	6	Dec. 1	1,076	14 6	8 12	13 12	11 4	15 0	9 6	13 2	9 13	13 6	10 8	14 4	10 4	13 8	11 10	168 15	24 2
	4	Cross Sht.-horn	Aged	Jan. 26	966	16 14	11 14	16 4	13 2	18 2	11 4	16 14	11 9	17 0	13 10	15 15	11 12	15 10	12 9	202 7	28 15
	5	Cross Sht.-horn	6	Nov. 17	1,076	13 12	13 2	13 12	11 4	16 14	11 14	12 8	11 2	13 0	11 10	14 13	9 4	13 0	11 4	177 3	25 5
	6	Cross Sht.-horn	Aged	Jan. 13	1,006	14 6	11 4	13 12	11 14	18 2	10 10	15 10	10 4	14 12	11 2	15 10	10 15	15 1	11 11	185 1	26 7
	7	Cross Sht.-horn	8	Apr. 28	1,126	24 6	18 12	23 12	20 0	25 10	18 2	25 0	18 1	26 2	19 6	28 5	19 3	28 0	19 8	314 3	44 14
	8	Cross Ayrshire	3	Apr. 13	723	15 10	10 0	15 10	12 8	16 14	9 6	15 0	8 14	13 14	9 6	15 1	9 8	13 14	10 13	176 6	25 3
	9	Cross Sht.-horn	Aged	Feb. 16	965	13 12	9 6	13 12	10 0	18 2	8 12	16 4	9 14	14 14	10 5	14 3	9 14	14 10	11 0	174 12	24 15
	10	Ayrshire -	6	Apr. 3	866	18 12	14 6	18 2	17 8	20 10	13 12	21 4	13 7	21 2	14 13	20 15	13 9	20 4	17 0	245 8	35 1
	11	Guernsey -	4	Mar. 30	781	16 14	10 10	16 4	16 4	15 0	12 8	16 14	12 9	17 14	12 14	16 9	12 5	15 10	14 0	206 3	29 7
	12	Cross Sht.-horn	7	Nov. 16	984	15 0	9 6	15 0	7 8	15 0	9 6	15 0	12 4	16 0	11 10	16 5	10 14	12 11	12 0	178 0	25 7
				Totals -	11,850	188 12	136 4	185 10	151 14	212 8	135 10	196 10	138 15	196 2	145 12	200 13	137 4	191 10	155 7	2,373 3	—
				Means -	988	15 12	11 6	15 8	12 10	17 11	11 5	16 6	11 9	16 6	12 2	16 12	11 7	15 15	12 15	197 12	28 4

Table IX.—*continued.*

Detailed Record of Food consumed, and Milk yielded, by Cows fed on the Unsewaged and Sewaged Meadow Grass, with Oilcake in addition.

Second Season, 1862; 7 days.—May 9 to May 15.

Three Cows.—Unsewaged Grass.

Food consumed.		Friday.	Saturday.	Sunday.	Monday.	Tuesday.	Wednesday.	Thursday.	Total in 7 days.	Per head per day.
Grass — From which Field, Plot, and Crop.		*	*	*	*	*	*	*	—	—
Grass — Quantities weighed	tons. cwts. qrs. lbs.	0 3 1 4	0 5 0 0	0 4 2 10	0 4 2 9	0 5 0 14	0 5 0 14	0 2 0 0	1 9 2 23	0 1 1 18
Oilcake (equal parts linseed and rape cake)	tons. cwts. qrs. lbs.	0 0 0 9	0 0 0 9	0 0 0 9	0 0 0 9	0 0 0 9	0 0 0 9	0 0 0 9	0 0 2 7	0 0 0 3

Yield of Milk, &c.	Cows. Nos.	Breed.	Years old.	Dates of Calving.	Weights (May 15†) lbs.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	—	—
						lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs.	lbs. ozs.
	1	Cross Sht.-horn	6	Mar. 20	966	22 7	13 5	21 10	13 3	19 15	13 0	21 4	12 7	19 0	12 15	19 7	15 11	20 6	11 13	236 7	33 12
	2	Cross Sht.-horn	7	Dec. 25	1,004	13 1	12 0	14 6	11 4	14 1	10 8	14 6	11 10	14 7	11 12	13 0	12 15	16 4	10 5	179 15	25 11
	3	Cross Sht.-horn	Aged	Feb. 26	896	19 8	15 6	20 9	14 0	22 0	13 0	20 8	12 2	20 8	11 11	21 10	15 11	20 12	12 5	239 10	34 4
				Totals -	2,866	55 0	40 11	56 9	38 7	56 0	36 8	56 2	36 3	53 15	36 6	54 1	44 5	57 6	34 7	656 0	—
				Means -	955	18 5	13 10	18 14	12 13	18 11	12 3	18 11	12 1	17 15	12 2	18 0	14 12	19 2	11 8	218 11	31 4

Twelve Cows.—Sewaged Grass.

Food consumed.		Ten-acre, Plot 3, Crop 1.	Ten-acre, Plot 3, Crop 1.	Ten-acre, Plot 3, Crop 1.	Ten-acre, Plot 3, Crop 1.	Ten-acre, Plot 2, Crop 1.	Ten-acre, Plot 4, Crop 1.	Ten-acre, Plot 4, Crop 1.	—	—
Grass — From which Field, Plot, and Crop.		—	—	—	—	—	—	—	—	—
Grass — Quantities weighed	tons. cwts. qrs. lbs.	0 13 1 23	1 0 1 23	0 19 1 1	0 19 1 1	0 16 2 24	1 0 2 9	0 0 1 8	1 1 1 2	0 1 2 7
Oilcake (equal parts linseed and rape cake)	tons. cwts. qrs. lbs.	0 0 1 8	0 0 1 8	0 0 1 8	0 0 1 8	0 0 1 8	0 0 1 8	0 0 1 8	0 2 1 0	0 0 0 3

Yield of Milk, &c.	Cows. Nos.	Breed.	Years old.	Dates of Calving.	Weights (May 1). lbs.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	—	—
						lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.
	1	Cross Sht.-horn	6	Nov. 18	1,143	14 8	9 11	14 3	10 10	14 1	10 6	15 8	9 0	13 8	11 2	13 12	9 8	13 14	11 0	170 11	24 6
	2	Cross Sht.-horn	8	Feb. 2	1,138	15 0	9 8	12 7	10 2	13 4	9 0	12 10	8 0	12 0	10 10	13 10	10 1	12 4	9 0	157 8	22 8
	3	Cross Sht.-horn	6	Dec. 1	1,076	14 1	9 13	12 9	10 14	13 1	11 2	13 12	9 0	12 8	10 8	12 10	10 1	13 6	9 6	162 11	23 4
	4	Cross Sht.-horn	Aged	Jan. 26	966	15 10	10 14	14 6	11 8	14 13	9 8	14 11	9 8	13 7	11 0	15 6	11 1	15 0	10 0	176 12	25 4
	5	Cross Sht.-horn	6	Nov. 17	1,076	12 10	10 10	12 0	10 9	13 0	11 0	11 12	8 12	10 12	9 15	12 4	9 4	12 3	10 8	155 3	22 3
	6	Cross Sht.-horn	Aged	Jan. 13	1,006	15 10	9 13	14 10	11 6	15 6	9 11	15 2	10 0	14 2	10 6	15 1	10 7	15 4	9 4	176 2	25 3
	7	Cross Sht.-horn	8	Apr. 28	1,126	26 9	17 4	26 0	18 1	26 4	18 6	20 4	16 0	22 14	17 5	23 8	18 2	23 0	16 11	290 4	41 7
	8	Cross Ayrshire	3	Apr. 13	723	14 4	8 15	14 2	9 4	14 1	9 7	13 10	9 0	13 8	9 13	13 14	9 4	13 0	9 0	161 2	23 0
	9	Cross Sht.-horn	Aged	Feb. 16	965	14 0	10 5	14 6	9 9	14 2	9 2	14 4	8 4	13 14	10 6	12 8	11 12	12 8	9 4	164 4	23 7
	10	Ayrshire -	6	Apr. 3	866	21 2	14 4	20 8	14 5	20 8	14 6	20 4	12 12	19 0	15 4	20 13	14 11	20 7	13 15	242 3	34 10
	11	Guernsey -	4	Mar. 30	781	16 3	11 7	17 0	12 0	17 4	12 10	15 8	11 0	15 0	12 2	15 10	12 8	13 15	10 11	192 14	27 9
	12	Cross Sht.-horn	7	Nov. 16	984	14 2	9 13	12 9	10 14	14 10	10 8	13 10	8 10	14 4	10 9	15 2	11 1	15 11	10 0	171 7	24 8
				Totals -	11,850	193 11	132 5	184 12	139 2	190 6	135 2	180 15	119 14	174 13	139 0	184 2	137 12	180 8	128 11	2,221 1	—
				Means -	988	16 2	11 0	15 6	11 10	15 14	11 4	15 1	10 0	14 9	11 9	15 6	11 8	15 1	10 11	185 1	26 7

Table IX.—*continued.*

Detailed Record of Food consumed, and Milk yielded, by Cows fed on the Unsewaged and Sewaged Meadow Grass, with Oilcake in addition.
Second Season, 1862 ; 7 days.—May 16 to May 22.

Three Cows.—Unsewaged Grass.

			Friday.	Saturday.	Sunday.	Monday.	Tuesday.	Wednesday.	Thursday.	Total in 7 days.	Per head per day.
Food consumed.	Grass — From which Field, Plot, and Crop.		Ten-acre, Plot 0,* Crop 1.	Ten-acre, Plot 0,* Crop 1.	Ten-acre, Plot 0,* Crop 1.	Ten-acre, Plot 0,* Crop 1.	Ten-acre, Plot 0,* Crop 1.	Ten-acre, Plot 0,* Crop 1.	Ten-acre, Plot 0,* Crop 1.	—	—
			tons. cwts. qrs. lbs.	*tons. cwts. qrs. lbs.*	*tons. cwts. qrs. lbs.*	*tons. cwts. qrs. lbs.*	*tons. cwts. qrs. lbs.*	*tons. cwts. qrs. lbs.*	*tons. cwts. qrs. lbs.*	*tons. cwts. qrs. lbs.*	*tons. cwts. qrs. lbs.*
	Grass — Quantities weighed		0 5 0 9½	0 5 3 0½	0 5 1 25½	0 5 2 0	0 6 3 27½	0 4 3 20½	0 4 3 19½	1 18 2 19	0 1 3 10
	Oilcake (equal parts linseed and rape cake)		0 0 0 9	0 0 0 9	0 0 0 9	0 0 0 9	0 0 0 9	0 0 0 9	0 0 0 9	0 0 2 7	0 0 0 3
Yield of Milk, &c.	Cows. Nos.	Breed.	Years old.	Dates of Calving.	Weights (May 15) *lbs.*	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	—	—
						lbs. ozs.	*lbs. ozs.*	*lbs. ozs.*	*lbs. ozs.*	*lbs. ozs.*	*lbs. ozs.*	*lbs. ozs.*	*lbs. ozs.*	*lbs. ozs.*	*lbs. ozs.*	*lbs. ozs.*	*lbs. ozs.*	*lbs. ozs.*	*lbs. ozs.*	*lbs. ozs.*	*lbs. ozs.*
	1	Cross Sht.-horn	6	Mar. 20	966	16 10	12 2	18 11	13 4	19 7	14 11	19 12	13 4	17 6	13 12	19 8	12 4	16 13	12 8	220 0	31 7
	2	Cross Sht.-horn	7	Dec. 25	1,004	15 4	11 4	14 14	10 9	14 0	13 11	12 11	10 4	12 10	10 0	12 9	9 5	14 8	10 12	172 5	24 10
	3	Cross Sht.-horn	Aged	Feb. 26	896	22 2	14 4	20 12	13 8	19 14	10 12	17 10	13 12	18 2	13 3	19 12	13 4	18 13	12 13	228 9	32 10
				Totals -	2,866	54 0	37 10	54 5	37 5	53 5	39 2	50 1	37 4	48 2	36 15	51 13	34 13	50 2	36 1	620 14	—
				Means -	955	18 0	12 9	18 2	12 7	17 12	13 1	16 11	12 7	16 1	12 5	17 4	11 9	16 11	12 0	206 15	29 9

Twelve Cows.—Sewaged Grass.

Food consumed.	Grass — From which Field, Plot, and Crop.		Ten-acre, Plot 4, Crop 1.	Ten-acre, Plot 4, Crop 1.	Ten-acre, Plot 3, Crop 1.	Ten-acre, Plot 3, Crop. 1.	Ten-acre, Plot 3, Crop 1.	Ten-acre, Plot 4, Crop 1.	Ten-acre, Plots 4, 3, & 00,* Crop 1.	—	—
			tons. cwts. qrs. lbs.	*tons. cwts. qrs. lbs.*	*tons. cwts. qrs. lbs.*	*tons. cwts. qrs. lbs.*	*tons. cwts. qrs. lbs.*	*tons. cwts. qrs. lbs.*	*tons. cwts. qrs. lbs.*	*tons. cwts. qrs. lbs.*	*tons. cwts. qrs. lbs.*
	Grass — Quantities weighed		0 13 1 23	0 15 3 21	0 0 1 8	0 15 0 15	0 14 1 23	0 15 2 23	0 19 2 6	5 10 0 22	0 1 1 7
	Oilcake (equal parts linseed and rape cake)		0 0 1 8	0 0 1 8	0 0 1 8	0 0 1 8	0 0 1 8	0 0 1 8	0 0 1 8	0 2 1 0	0 0 0 3
Yield of Milk, &c.	Cows. Nos.	Breed.	Years old.	Dates of Calving.	Weights (May 1) *lbs.*	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	—	—
						lbs. ozs.	*lbs. ozs.*	*lbs. ozs.*	*lbs. ozs.*	*lbs. ozs.*	*lbs. ozs.*	*lbs. ozs.*	*lbs. ozs.*	*lbs. ozs.*	*lbs. ozs.*	*lbs. ozs.*	*lbs. ozs.*	*lbs. ozs.*	*lbs. ozs.*	*lbs. ozs.*	*lbs. ozs.*
	1	Cross Sht.-horn	6	Nov. 18	1,143	13 10	9 5	13 11	11 0	13 4	11 6	13 2	9 5	12 0	10 2	14 0	8 14	13 14	9 15	163 8	23 6
	2	Cross Sht.-horn	8	Feb. 2	1,138	12 6	10 4	12 14	10 12	13 10	11 6	13 12	9 3	12 4	10 0	15 4	8 15	13 2	9 10	163 6	23 5
	3	Cross Sht.-horn	6	Dec. 1	1,076	11 0	10 4	14 0	9 11	11 14	11 0	13 14	9 9	11 10	10 3	13 12	9 11	13 0	9 11	159 3	22 12
	4	Cross Sht.-horn	Aged	Jan. 26	966	14 8	9 12	14 7	11 11	15 2	12 0	14 13	8 10	13 6	10 9	15 8	10 6	14 6	10 2	175 4	25 1
	5	Cross Sht.-horn	6	Nov. 17	1,076	10 6	9 9	12 13	11 8	12 6	12 2	12 8	8 10	11 0	11 13	12 0	8 11	12 2	10 2	155 10	22 4
	6	Cross Sht.-horn	Aged	Jan. 13	1,006	13 6	10 4	14 7	9 15	14 12	12 2	14 0	10 8	13 8	10 15	11 1	9 5	14 8	10 4	168 15	24 2
	7	Cross Sht.-horn	8	Apr. 28	1,126	22 0	15 3	20 6	13 5	17 0	13 5	4 8	3 2	0 0	18 10	25 2	16 13	23 12	16 11	209 13	30 0
	8	Cross Ayrshire	3	Apr. 13	723	12 7	8 12	13 6	9 3	13 4	9 3	12 5	7 10	12 8	8 13	12 8	7 13	12 11	8 4	148 11	21 4
	9	Cross Sht.-horn	Aged	Feb. 16	965	13 4	10 11	14 5	9 15	12 12	11 11	14 7	8 7	13 6	9 14	13 10	9 15	14 0	10 3	161 8	23 13
	10	Ayrshire -	6	Apr. 3	866	19 10	13 8	20 14	13 15	20 7	14 5	20 7	11 6	17 10	14 7	19 4	14 0	20 0	13 5	233 2	33 5
	11	Guernsey -	4	Mar. 30	781	16 0	12 4	15 8	10 5	15 0	9 7	16 3	8 12	14 14	11 8	15 8	12 12	15 8	10 10	184 3	26 5
	12	Cross Sht.-horn	7	Nov. 16	984	16 12	9 2	17 11	10 1	14 12	11 12	15 0	10 0	13 12	10 14	16 3	10 2	14 6	10 1	180 8	25 13
				Totals -	11,850	175 5	128 14	184 6	131 5	174 3	139 11	164 15	105 2	145 14	137 12	183 12	127 5	181 5	128 14	2,108 11	—
				Means -	986	14 10	10 12	15 6	10 15	14 8	11 10	13 12	8 12	12 2	11 8	15 5	10 10	15 2	10 12	175 12	25 2

Table IX.—*continued.*

Detailed Record of Food consumed, and Milk yielded, by Cows fed on the Unsewaged and Sewaged Meadow Grass, with Oilcake in addition.

Second Season, 1862 ; 7 days.—May 23 to May 29.

Three Cows.—Unsewaged Grass.

Food consumed.		Friday.	Saturday.	Sunday.	Monday.	Tuesday.	Wednesday.	Thursday.	Total in 7 days.	Per head per day.
Grass	From which Field, Plot, and Crop.	Ten-acre, Plot 0,* Crop 1.	—	Ten-acre, Plot 0,* Crop 1.	Ten-acre, Plot 0,* Crop 1.	Ten-acre, Plot 0,* Crop 1.	Ten-acre, Plot 0,* Crop 1.	—	—	—
	Quantities weighed	0 7 2 15½	..	0 4 0 15½	0 4 0 18	0 6 1 3¾	0 7 1 13½	..	1 9 2 10	0 1 1 18
Oilcake (equal parts linseed and rape-cake)		0 0 0 9	0 0 0 9	0 0 0 9	0 0 0 9	0 0 0 9	0 0 0 9	0 0 0 9	0 0 2 7	0 0 0 3

Yield of Milk, &c.	Cows. Nos.	Breed.	Years old.	Dates of Calving.	Weights (May 29).	Friday A.M.	Friday P.M.	Saturday A.M.	Saturday P.M.	Sunday A.M.	Sunday P.M.	Monday A.M.	Monday P.M.	Tuesday A.M.	Tuesday P.M.	Wednesday A.M.	Wednesday P.M.	Thursday A.M.	Thursday P.M.	—	—
						lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs.	ozs.
	1	Cross Sht.-horn	6	Mar. 20	1,042	17 10	13 13	19 11	10 12	18 10	13 6	17 7	12 9	17 3	14 13	17 3	14 5	18 2	13 4	218	31 3
	2	Cross Sht.-horn	7	Dec. 25	1,054	15 2	10 8	12 9	8 12	12 7	11 13	12 8	10 15	11 4	12 5	12 13	12 2	12 13	11 4	167	23 14
	3	Cross Sht.-horn	Aged	Feb. 26	948	20 0	13 6	19 7	12 2	19 4	13 6	19 6	13 2	18 2	15 14	19 3	14 12	17 3	17 0	232	33 3
		Totals			3,044	52 12	37 11	51 11	31 6	50 5	38 9	49 5	36 10	46 9	43 0	49 3	41 3	48 2	41 8	617	14
		Means			1,015	17 9	12 9	17 4	10 8	16 12	12 14	16 7	12 3	15 8	14 5	16 6	13 12	16 1	13 13	205	15	29 7

Twelve Cows.—Sewaged Grass.

Food consumed.		Friday.	Saturday.	Sunday.	Monday.	Tuesday.	Wednesday.	Thursday.	Total in 7 days.	Per head per day.
Grass	From which Field, Plot, and Crop.	Ten-acre, Plot 3, Crop 1.	Five-acre, Plot 3, Crop 1.	Five-acre, Plot 3, Crop 1.	Five-acre, Plot 3, Crop 1.	Five-acre, Plot 3, Crop 1.	Five-acre, Plot 2, Crop 1.	Ten-acre, Plot 2, Crop 1.	—	—
	Quantities weighed	0 15 2 23	1 7 2 0	0 10 0 23	0 10 0 24	0 18 0 16	0 17 0 5	0 16 3 9	5 15 2 16	0 1 1 14
Oilcake (equal parts linseed and rape-cake)		0 0 1 8	0 0 1 8	0 0 1 8	0 0 1 8	0 0 1 8	0 0 1 8	0 0 1 8	0 2 1 0	0 0 0 3

Yield of Milk, &c.	Cows. Nos.	Breed.	Years old.	Dates of Calving.	Weights (May 29).	Friday A.M.	Friday P.M.	Saturday A.M.	Saturday P.M.	Sunday A.M.	Sunday P.M.	Monday A.M.	Monday P.M.	Tuesday A.M.	Tuesday P.M.	Wednesday A.M.	Wednesday P.M.	Thursday A.M.	Thursday P.M.	—	—
						lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs.	ozs.
	1	Cross Sht.-horn	6	Nov. 18	1,178	13 0	9 4	12 6	9 2	11 2	10 9	11 8	9 14	12 4	10 11	13 6	10 10	13 6	10 14	158	0	22 9
	2	Cross Sht.-horn	8	Feb. 2	1,208	12 7	10 5	13 8	10 4	11 12	11 5	12 3	9 8	12 3	10 10	13 4	9 6	12 12	9 0	158	7	22 10
	3	Cross Sht.-horn	6	Dec. 1	1,153	12 11	10 0	13 4	10 1	11 14	9 6	12 4	9 13	11 8	9 6	12 8	9 12	12 5	10 6	155	2	22 3
	4	Cross Sht.-horn	Aged	Jan. 26	972	13 8	9 15	13 6	10 11	13 6	9 6	12 14	10 3	13 10	11 3	14 0	10 12	13 10	10 10	167	2	23 14
	5	Cross Sht.-horn	6	Nov. 17	1,107	13 10	10 3	13 0	9 6	12 13	11 6	11 0	9 13	12 1	11 11	12 2	10 8	12 0	10 13	160	6	22 15
	6	Cross Sht.-horn	Aged	Jan. 13	1,096	14 6	10 5	14 13	10 7	13 6	9 14	15 1	9 6	13 2	10 10	14 4	11 1	14 2	10 6	171	3	24 7
	7	Cross Sht.-horn	6	May 2	1,068	23 4	16 13	23 8	16 14	21 0	17 6	21 4	16 0	21 1	17 5	22 0	18 2	22 4	15 12	272	9	38 15
	8	Cross Ayrshire	3	Apr. 13	785	13 0	8 9	13 0	8 10	11 8	8 9	11 0	8 0	11 8	8 10	11 8	8 12	11 6	8 1	142	1	20 5
	9	Cross Sht.-horn	Aged	Feb. 16	1,018	14 1	10 14	14 0	12 7	14 2	10 11	13 1	9 12	12[illegible]	11 0	13 10	10 6	13 7	9 8	168	15	24 2
	10	Ayrshire	6	Apr. 3	950	20 6	14 10	20 0	14 6	18 12	14 4	18 2	13 13	18 0	15 4	19 8	14 2	19 6	15 6	235	15	33 11
	11	Guernsey	4	Mar. 30	835	15 0	10 10	15 10	11 12	14 10	11 10	13 8	10 11	14 8	12 2	14 8	12 1	14 6	12 4	183	4	26 3
	12	Cross Sht.-horn	7	Nov. 16	1,090	14 7	10 0	15 13	9 6	13 8	10 8	13 4	9 7	13 4	11 7	14 5	10 15	13 12	10 4	170	4	24 5
		Totals			12,460	179 12	131 8	182 4	133 6	167 13	134 14	165 1	126 4	165 1	139 15	174 15	136 7	172 12	133 4	2,143	4	
		Means			1,038	15 0	10 15	15 3	11 2	14 0	11 4	13 12	10 8	13 12	11 11	14 9	11 6	14 6	11 2	178	10	25 8

Table IX.—*continued.*

Detailed Record of Food consumed, and Milk yielded, by Cows fed on the Unsewaged and Sewaged Meadow Grass, with Oilcake in addition.

Second Season, 1862 ; 7 days.—May 30 to June 5.

Three Cows.—Unsewaged Grass.

		Friday.	Saturday.	Sunday.	Monday.	Tuesday.	Wednesday.	Thursday.	Total in 7 days.	Per head per day.
Food consumed.	From which Field, Plot, and Crop	Ten-acre, Plots 0*&1, Crop 1.	—	Ten-acre, Plot 1, Crop 1.	Ten-acre, Plot 1, Crop 1.	Ten-acre, Plot 1, Crop 1.	Ten-acre, Plot 1, Crop 1.	Ten acre, Plot 1, Crop 1.	—	—
Grass	Quantities weighed	*tons. cwts. qrs. lbs.* 0 5 1 19½	*tons. cwts. qrs. lbs.* — — — —	*tons. cwts. qrs. lbs.* 0 4 2 14	*tons. cwts. qrs. lbs.* 0 4 2 12½	*tons. cwts. qrs. lbs.* 0 5 1 1½	*tons. cwts. qrs. lbs.* 0 5 0 4½	*tons. cwts. qrs. lbs.* 0 3 2 10½	*tons. cwts. qrs. lbs.* 1 8 2 6½	*tons. cwts. qrs. lbs.* 0 1 1 12
	Oilcake (equal parts linseed and rape cake)	0 0 0 9	0 0 0 9	0 0 0 9	0 0 0 9	0 0 0 9	0 0 0 9	0 0 0 9	0 0 2 7	0 0 0 3

Yield of Milk, &c.	Cows. Nos.	Breed.	Years old.	Dates of Calving.	Weights (May 29). *lbs.*	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	—	—
						lbs. ozs.	*lbs. ozs.*	*lbs. ozs.*	*lbs. ozs.*	*lbs. ozs.*	*lbs. ozs.*	*lbs. ozs.*	*lbs. ozs.*	*lbs. ozs.*	*lbs. ozs.*	*lbs. ozs.*	*lbs. ozs.*	*lbs. ozs.*	*lbs. ozs.*	*lbs. ozs.*	*lbs. ozs.*
	1	Cross Sht.-horn	6	Mar. 20	1,042	19 0	13 2	19 12	13 11	17 10	11 8	17 10	14 1	16 6	13 7	16 8	12 8	15 9	12 5	213 1	30 7
	2	Cross Sht.-horn	7	Dec. 25	1,054	12 7	11 1	10 8	11 11	13 0	10 4	11 8	12 4	12 8	11 0	10 4	12 12	10 8	11 6	161 1	23 0
	3	Cross Sht.-horn	Aged	Feb. 26	948	17 1	17 1	20 2	12 9	17 14	12 8	17 14	14 0	17 4	12 2	18 6	12 13	17 8	11 12	218 14	31 4
				Totals -	3,044	48 8	41 4	50 6	37 15	48 8	34 4	47 0	40 5	46 2	36 9	45 2	38 1	43 9	35 7	593 0	—
				Means -	1,015	16 3	13 12	16 12	12 10	16 3	11 7	15 11	13 7	15 6	12 3	15 1	12 11	14 8	11 13	197 11	28 4

Twelve Cows.—Sewaged Grass

		Ten-acre, Plot 3, Crop 1.	Ten-acre, Plot 3, Crop 1.	Ten-acre, Plot 3, Crop 1.	Ten-acre, Plot 3, Crop 1.	Ten-acre, Plot 3, Crop 1.	Ten-acre, Plot 3, Crop 1.	Ten-acre, Plot 3, Crop 1.	—	—
Food consumed. Grass — Quantities weighed		*tons. cwts. qrs. lbs.* 0 16 3 22	*tons. cwts. qrs. lbs.* 1 1 2 9	*tons. cwts. qrs. lbs.* 0 17 0 1	*tons. cwts. qrs. lbs.* 0 17 0 0	*tons. cwts. qrs. lbs.* 0 13 2 23	*tons. cwts. qrs. lbs.* 0 13 3 4	*tons. cwts. qrs. lbs.* 0 7 1 21	*tons. cwts. qrs. lbs.* 5 7 1 24	*tons. cwts. qrs. lbs.* 0 1 1 3
Oilcake (equal parts linseed and rape cake)		0 0 1 8	0 0 1 8	0 0 1 8	0 0 1 8	0 0 1 8	0 0 1 8	0 0 1 8	0 2 1 0	0 0 0 3

Yield of Milk, &c.	Cows. Nos.	Breed.	Years old.	Dates of Calving.	Weights (May 29). *lbs.*	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	—	—
						lbs. ozs.	*lbs. ozs.*	*lbs. ozs.*	*lbs. ozs.*	*lbs. ozs.*	*lbs. ozs.*	*lbs. ozs.*	*lbs. ozs.*	*lbs. ozs.*	*lbs. ozs.*	*lbs. ozs.*	*lbs. ozs.*	*lbs. ozs.*	*lbs. ozs.*	*lbs. ozs.*	*lbs. ozs.*
	1	Cross Sht.-horn	6	Nov. 18	1,178	13 1	10 3	12 14	9 5	12 2	9 8	12 10	11 15	12 6	9 8	11 12	9 4	11 12	9 4	155 8	22 3
	2	Cross Sht.-horn	8	Feb. 2	1,208	12 2	9 4	11 4	9 10	12 14	9 0	11 14	11 7	11 12	9 6	12 0	9 2	12 2	9 3	151 0	21 9
	3	Cross Sht.-horn	6	Dec. 1	1,153	11 13	9 5	12 6	9 0	11 12	9 7	11 6	11 1	11 9	9 0	11 4	8 12	11 4	8 12	147 1	21 0
	4	Cross Sht.-horn	Aged	Jan. 26	972	14 2	10 6	13 10	9 7	12 4	10 0	12 4	11 8	12 7	9 4	11 6	8 3	11 8	8 1	156 6	22 5
	5	Cross Sht.-horn	6	Nov. 17	1,107	12 0	9 10	11 0	8 12	10 0	9 10	11 4	11 7	10 0	9 8	9 8	8 5	9 4	8 1	133 1	19 12
	6	Cross Sht.-horn	Aged	Jan. 13	1,096	14 4	10 10	14 1	9 4	12 6	10 11	13 2	12 4	12 14	10 0	13 14	9 4	12 6	9 11	164 11	23 8
	7	Cross Sht.-horn	6	May 2	1,068	20 8	16 2	22 0	15 2	20 6	15 4	20 6	15 2	20 7	15 12	20 8	14 3	20 2	14 8	250 6	35 12
	8	Cross Ayrshire	3	Apr. 13	785	11 9	8 3	11 6	8 0	11 0	8 0	9 13	9 10	10 7	7 4	10 3	7 4	10 4	6 15	129 14	18 9
	9	Cross Sht.-horn	Aged	Feb. 16	1,018	12 4	10 7	11 8	8 14	11 2	9 12	11 12	9 12	12 13	9 0	11 8	10 8	12 8	8 13	150 9	21 8
	10	Ayrshire -	6	Apr. 3	950	16 3	14 2	17 4	12 12	17 0	12 14	17 10	13 6	16 5	13 4	17 10	13 7	17 12	11 14	211 7	30 3
	11	Guernsey -	4	Mar. 30	835	15 0	10 9	15 7	10 13	12 2	11 9	13 0	12 11	13 8	9 3	13 2	10 7	13 6	10 12	171 9	24 8
	12	Cross Sht.-horn	7	Nov. 16	1,090	13 6	11 2	12 13	10 10	12 10	10 1	13 3	10 12	12 12	8 12	13 8	8 7	13 7	9 1	160 8	22 15
				Totals -	12,460	166 4	129 15	165 9	121 9	155 10	125 12	158 0	140 15	157 4	119 10	156 8	117 6	155 11	116 15	1,987 0	—
				Means -	1,038	13 14	10 13	13 13	10 2	12 15	10 8	13 3	11 12	13 2	9 15	13 1	9 12	12 15	9 12	165 9	23 11

Table IX.—*continued.*

Detailed Record of Food consumed, and Milk yielded, by Cows fed on the Unsewaged and Sewaged Meadow Grass, with Oilcake addition.

Second Season 1862; 7 days.—June 6 to June 12.

Three Cows.—Unsewaged Grass.

Food consumed.		Friday.	Saturday.	Sunday.	Monday.	Tuesday.	Wednesday.	Thursday.	Total in 7 days.	Per head per day.
Grass	From which Field, Plot, and Crop.	—	Ten-acre, Plot 1, Crop 1.	Ten-acre, Plot 1, Crop 1.	Ten-acre, Plot 1, Crop 1.	Ten-acre, Plot 1, Crop 1.	Ten-acre, Plot 1, Crop 1.	Ten-acre, Plot 1, Crop 1.	—	—
	Quantities weighed	*tons.* *cwts.* *qrs.* *lbs.* 0 0 0 0	*tons.* *cwts.* *qrs.* *lbs.* 0 3 2 12½ 0 0 0 9	*tons.* *cwts.* *qrs.* *lbs.* 0 4 0 15½ 0 0 0 9	*tons.* *cwts.* *qrs.* *lbs.* 0 4 0 14 0 0 0 9	*tons.* *cwts.* *qrs.* *lbs.* 0 4 3 6½ 0 0 0 9	*tons.* *cwts.* *qrs.* *lbs.* 0 4 3 0½ 0 0 0 9	*tons.* *cwts.* *qrs.* *lbs.* 0 5 0 18½ 0 0 0 9	*tons.* *cwts.* *qrs.* *lbs.* 1 6 2 11½ 0 0 2 7	*tons.* *cwts.* *qrs.* *lbs.* 0 1 1 2 0 0 0 3
Oilcake (equal parts linseed and rape cake)										

Yield of Milk, &c.	Cows. Nos.	Breed.	Years old.	Dates of Calving	Weights (May 29). *lbs.*	Friday. A.M. *lbs.* *ozs.*	Friday. P.M. *lbs.* *ozs.*	Saturday. A.M. *lbs.* *ozs.*	Saturday. P.M. *lbs.* *ozs.*	Sunday. A.M. *lbs.* *ozs.*	Sunday. P.M. *lbs.* *ozs.*	Monday. A.M. *lbs.* *ozs.*	Monday. P.M. *lbs.* *ozs.*	Tuesday. A.M. *lbs.* *ozs.*	Tuesday. P.M. *lbs.* *ozs.*	Wednesday. A.M. *lbs.* *ozs.*	Wednesday. P.M. *lbs.* *ozs.*	Thursday. A.M. *lbs.* *ozs.*	Thursday. P.M. *lbs.* *ozs.*	— *lbs.* *ozs.*	— *lbs.* *ozs.*
	1	Cross Sht.-horn	6	Mar. 20	1,042	15 12	13 0	16 4	12 6	16 2	11 6	16 0	11 14	16 0	12 10	16 3	13 1	16 14	12 0	198 5	28 5
	2	Cross Sht.-horn	7	Dec. 25	1,054	10 4	11 2	10 8	11 10	10 8	13 4	11 10	10 14	10 1	10 8	10 10	13 6	10 14	12 0	157 3	22 7
	3	Cross Sht.-horn	Aged	Feb. 26	948	16 4	12 2	17 0	11 15	15 8	11 6	16 0	11 9	16 9	12 1	16 8	12 11	16 7	12 15	198 15	28 7
		Totals	-		3,044	42 4	36 4	43 12	35 15	42 3	35 8	43 12	33 13	42 10	34 7	43 12	38 11	43 8	38 0	554 7	—
		Means	-		1,015	14 1	12 2	14 9	12 0	14 1	11 13	14 9	11 4	14 3	11 8	14 9	12 15	14 8	12 11	184 13	26 6

Twelve Cows.—Sewaged Grass.

Food consumed.		Ten-acre, Plot 3, Crop 1.	Ten-acre, Plots 00* and 2, Crop 1.	Ten-acre, Plot 2, Crop 1.	Ten-acre, Plot 2, Crop 1.	Ten-acre, Plot 2, Crop 1,	Ten-acre, Plot 2, Crop 1.	Ten-acre, Plot 2, Crop 1.	—	—
Grass	From which Field, Plot, and Crop.									
	Quantities weighed	*tons.* *cwts.* *qrs.* *lbs.* 0 10 2 4	*tons.* *cwts.* *qrs.* *lbs.* 0 15 2 8	*tons.* *cwts.* *qrs.* *lbs.* 0 14 2 16	*tons.* *cwts.* *qrs.* *lbs.* 0 14 2 17	*tons.* *cwts.* *qrs.* *lbs.* 0 13 0 11	*tons.* *cwts.* *qrs.* *lbs.* 0 18 3 9	*tons.* *cwts.* *qrs.* *lbs.* 1 1 0 23	*tons.* *cwts.* *qrs.* *lbs.* 5 8 2 4	*tons.* *cwts.* *qrs.* *lbs.* 0 1 1 5
Oilcake (equal parts linseed and rape cake)		0 0 1 8	0 0 1 8	0 0 1 8	0 0 1 8	0 0 1 8	0 0 1 8	0 0 1 8	0 2 1 0	0 0 0 3

Yield of Milk, &c.	Cows. Nos.	Breed.	Years old.	Dates of Calving.	Weights (May 29). *lbs.*	Ten-acre, Plot 3, Crop 1. A.M. *lbs.* *ozs.*	Ten-acre, Plot 3, Crop 1. P.M. *lbs.* *ozs.*	Ten-acre, Plots 00* and 2, Crop 1. A.M. *lbs.* *ozs.*	Ten-acre, Plots 00* and 2, Crop 1. P.M. *lbs.* *ozs.*	Ten-acre, Plot 2, Crop 1. A.M. *lbs.* *ozs.*	Ten-acre, Plot 2, Crop 1. P.M. *lbs.* *ozs.*	Ten-acre, Plot 2, Crop 1. A.M. *lbs.* *ozs.*	Ten-acre, Plot 2, Crop 1. P.M. *lbs.* *ozs.*	Ten-acre, Plot 2, Crop 1, A.M. *lbs.* *ozs.*	Ten-acre, Plot 2, Crop 1, P.M. *lbs.* *ozs.*	Ten-acre, Plot 2, Crop 1. A.M. *lbs.* *ozs.*	Ten-acre, Plot 2, Crop 1. P.M. *lbs.* *ozs.*	Ten-acre, Plot 2, Crop 1. A.M. *lbs.* *ozs.*	Ten-acre, Plot 2, Crop 1. P.M. *lbs.* *ozs.*	— *lbs.* *ozs.*	— *lbs.* *ozs.*
	1	Cross Sht.-horn	6	Nov. 18	1,178	12 2	8 8	11 8	9 4	12 4	10 3	11 4	9 0	11 6	9 0	11 15	9 2	12 0	9 8	147 0	21 0
	2	Cross Sht.-horn	8	Feb. 2	1,208	11 14	9 0	11 7	8 12	12 0	9 0	11 10	8 12	11 4	8 15	12 2	9 0	11 6	9 3	144 5	20 10
	3	Cross Sht.-horn	6	Dec. 1	1,153	11 8	9 0	9 12	8 12	11 8	9 4	11 0	8 10	10 8	9 0	11 7	7 13	11 4	8 9	137 15	19 11
	4	Cross Sht.-horn	Aged	Jan. 26	972	10 14	8 12	11 8	8 8	10 14	9 14	11 6	7 14	11 0	8 12	12 0	9 3	11 7	9 8	141 8	20 4
	5	Cross Sht.-horn	6	Nov. 17	1,107	11 0	8 0	10 3	7 8	10 4	10 6	10 4	7 13	10 4	8 7	10 11	8 10	10 3	8 2	131 11	18 13
	6	Cross Sht.-horn	Aged	Jan. 13	1,096	13 7	9 0	13 4	9 10	12 6	8 11	12 11	8 15	12 2	9 11	13 4	9 5	12 6	10 4	155 0	22 2
	7	Cross Sht.-horn	6	May 2	1,068	20 11	14 6	20 4	15 0	19 8	15 11	19 3	14 11	19 0	15 4	20 12	15 5	20 0	15 11	245 6	35 1
	8	Cross Ayrshire	3	Apl. 13	785	10 6	6 14	10 6	7 2	10 4	6 0	10 6	6 10	9 7	6 11	10 2	7 9	10 1	7 14	119 12	17 2
	9	Cross Sht.-horn	Aged	Feb. 16	1,018	11 4	8 1	12 10	9 7	12 6	9 3	12 2	8 6	12 8	10 0	13 11	10 0	12 13	10 4	152 11	21 13
	10	Ayrshire -	6	Apl. 3	950	17 2	12 13	17 0	12 4	15 8	13 4	16 4	11 15	17 2	13 5	19 0	13 4	18 0	13 6	210 3	30 0
	11	Guernsey -	4	Mar. 30	835	13 4	10 0	13 4	10 9	13 8	10 13	10 15	10 1	12 13	10 10	12 13	11 3	12 14	9 12	162 7	23 3
	12	Cross Sht.-horn	7	Nov. 16	1,090	13 7	9 0	12 14	8 13	12 11	8 12	14 4	9 2	12 12	9 11	14 2	9 10	13 6	9 10	158 2	22 9
		Totals	-		12,460	156 15	113 6	154 0	115 9	153 1	121 1	151 5	111 13	150 2	119 6	161 15	120 0	155 12	121 11	1,906 0	—
		Means	-		1,038	13 0	9 6	12 13	9 9	12 12	10 1	12 9	9 4	12 8	9 15	13 7	10 0	12 15	10 1	158 16	22 9

Detailed Record of Food consumed, and Milk yielded, by Cows fed on the Unsewaged and Sewaged Meadow Grass, with Oilcake in addition.

Second Season, 1862 ; 7 days.—June 13 to June 19.

Three Cows.—Unsewaged Grass.

		Friday.	Saturday.	Sunday.	Monday.	Tuesday.	Wednesday.	Thursday.	Total in 7 days.	Per head per day.
Food consumed.	From which Field, Plot, and Crop.	Ten-acre, Plot 1, Crop 1.	Ten-acre, Plot 1, Crop 1.	Ten-acre, Plot 1, Crop 1.	Ten-acre, Plot 1, Crop 1.	Ten-acre, Plot 1, Crop 1.	Ten-acre, Plot 1, Crop 1.	Ten-acre, Plot 1, Crop 1.	—	—
	Grass — Quantities weighed	*tons. cwts. qrs. lbs.* 0 4 3 8½	*tons. cwts. qrs. lbs.* 0 3 3 21¼	*tons. cwts. qrs. lbs.* 0 4 0 5½	*tons. cwts. qrs. lbs.* 0 4 0 6	*tons. cwts. qrs. lbs.* 0 5 1 18½	*tons. cwts. qrs. lbs.* 0 3 3 18½	*tons. cwts. qrs. lbs.* 0 3 3 2½	*tons. cwts. qrs. lbs.* 1 9 3 25	*tons. cwts. qrs. lbs.* 0 1 1 20
	Oilcake (equal parts linseed and rape cake)	0 0 0 9	0 0 0 9	0 0 0 9	0 0 0 9	0 0 0 9	0 0 0 9	0 0 0 9	0 0 2 7	0 0 0 3

Yield of Milk, &c. — Cows. Nos.	Breed.	Years old.	Dates of Calving.	Weights (May 29). *lbs.*	Friday A.M.	Friday P.M.	Saturday A.M.	Saturday P.M.	Sunday A.M.	Sunday P.M.	Monday A.M.	Monday P.M.	Tuesday A.M.	Tuesday P.M.	Wednesday A.M.	Wednesday P.M.	Thursday A.M.	Thursday P.M.	Total in 7 days.	Per head per day.
					lbs. ozs.	*lbs. ozs.*	*lbs. ozs.*	*lbs. ozs.*	*lbs. ozs.*	*lbs. ozs.*	*lbs. ozs.*	*lbs. ozs.*	*lbs. ozs.*	*lbs. ozs.*	*lbs. ozs.*	*lbs. ozs.*	*lbs. ozs.*	*lbs. ozs.*	*lbs.*	*lbs.*
1	Cross Sht.-horn	6	Mar. 20	1,042	16 5	11 11	16 1	11 8	15 8	11 4	15 7	11 6	15 4	12 2	16 0	11 2	15 15	10 6	189 15	27 2
2	Cross Sht.-horn	7	Dec. 25	1,054	10 2	11 7	10 8	12 13	11 0	10 6	9 10	11 8	10 4	11 0	10 1	9 4	10 11	11 13	150 7	21 8
3	Cross Sht.-horn	Aged	Feb. 26	948	16 0	12 1	15 8	12 0	16 0	11 15	15 9	11 8	17 6	11 1	16 8	12 3	16 2	11 7	195 4	27 14
			Totals -	3,044	42 7	35 3	42 1	36 5	42 8	33 9	40 10	34 6	42 14	34 3	42 9	32 9	42 12	33 10	535 10	—
			Means -	1,015	14 2	11 12	14 0	12 2	14 3	11 3	13 9	11 7	14 5	11 6	14 3	10 14	14 4	11 3	178 9	25 8

Twelve Cows.—Sewaged Grass.

		—	Ten-acre, Plot 2, Crop 1.	Ten-acre, Plot 2, Crop 1.	Ten-acre, Plot 2, Crop 1.	Ten-acre, Plot 2, Crop 1.	Ten-acre, Plot 2, Crop 1.	Ten-acre, Plot 2, Crop 1.	—	—
Food consumed.	From which Field, Plot, and Crop.									
	Grass — Quantities weighed	*tons. cwts. qrs. lbs.* —	*tons. cwts. qrs. lbs.* 0 13 1 22	*tons. cwts. qrs. lbs.* 0 7 1 22	*tons. cwts. qrs. lbs.* 0 7 2 23	*tons. cwts. qrs. lbs.* 0 12 2 19	*tons. cwts. qrs. lbs.* 0 12 0 23	*tons. cwts. qrs. lbs.* 0 13 0 21	*tons. cwts. qrs. lbs.* 3 6 3 18	*tons. cwts. qrs. lbs.* 0 0 3 5
	Oilcake (equal parts linseed and rape cake)	0 0 1 8	0 0 1 8	0 0 1 8	0 0 1 8	0 0 1 8	0 0 1 8	0 0 1 8	0 2 1 0	0 0 0 3

Yield of Milk, &c. — Cows. Nos.	Breed.	Years old.	Dates of Calving.	Weights (May 29). *lbs.*	Friday A.M.	Friday P.M.	Saturday A.M.	Saturday P.M.	Sunday A.M.	Sunday P.M.	Monday A.M.	Monday P.M.	Tuesday A.M.	Tuesday P.M.	Wednesday A.M.	Wednesday P.M.	Thursday A.M.	Thursday P.M.	Total in 7 days.	Per head per day.
					lbs. ozs.	*lbs. ozs.*	*lbs. ozs.*	*lbs. ozs.*	*lbs. ozs.*	*lbs. ozs.*	*lbs. ozs.*	*lbs. ozs.*	*lbs. ozs.*	*lbs. ozs.*	*lbs. ozs.*	*lbs. ozs.*	*lbs. ozs.*	*lbs. ozs.*	*lbs.*	*lbs.*
1	Cross Sht.-horn	6	Nov.18	1,178	11 9	9 8	12 6	9 0	11 9	13	11 1	8 12	12 8	8 11	12 7	9 4	12 1	8 10	147 2	21 0
2	Cross Sht.-horn	8	Feb. 2	1,208	11 13	9 6	11 8	8 14	11 12	9 8	10 9	8 5	11 10	8 6	11 3	8 9	11 8	7 3	140 2	20 0
3	Cross Sht.-horn	6	Dec. 1	1,153	10 6	8 7	10 7	8 6	10 11	7 4	8 2	7 0	10 7	8 5	11 1	8 4	10 9	7 12	127 1	18 2
4	Cross Sht.-horn	Aged	Jan. 26	972	11 8	8 8	10 13	8 0	12 0	8 4	8 7	8 7	10 14	7 13	11 8	7 13	11 0	8 2	133 1	19 0
5	Cross Sht.-horn	6	Nov.17	1,107	9 2	8 9	10 0	7 12	9 6	8 3	7 3	7 6	9 15	7 0	9 4	6 8	8 11	6 9	115 8	16 8
6	Cross Sht.-horn	Aged	Jan. 13	1,096	12 10	9 15	13 2	9 4	13 2	9 8	12 2	8 12	13 3	9 1	12 12	10 2	12 6	8 13	154 12	22 2
7	Cross Sht.-horn	6	May 2	1,068	19 8	16 0	19 2	14 14	19 10	14 11	18 0	14 5	22 1	14 1	19 10	14 0	19 12	14 1	239 11	34 4
8	Cross Ayrshire	3	Apr. 13	785	10 0	8 1	10 4	6 15	10 0	8 0	9 7	6 14	10 6	6 13	10 7	7 4	10 11	7 9	122 11	17 8
9	Cross Sht.-horn	Aged	Feb. 16	1,018	11 8	10 11	13 6	9 1	13 5	9 12	12 6	10 3	13 2	9 13	13 8	10 0	13 2	8 13	158 10	22 11
10	Ayrshire	6	Apr. 3	950	17 4	13 5	17 15	12 11	18 2	12 8	16 12	12 9	17 7	12 8	16 13	12 12	17 9	12 3	210 6	30 1
11	Guernsey	4	Mar.30	835	12 6	9 9	13 7	8 4	12 10	8 15	12 8	8 10	11 13	10 7	11 11	10 1	12 11	9 11	152 11	21 13
12	Cross Sht.-horn	7	Nov.16	1,090	12 9	10 0	14 7	8 12	12 12	9 11	12 2	9 7	13 5	9 2	12 4	9 4	12 13	8 8	155 0	22 2
			Totals -	12,460	150 2	121 15	156 13	111 13	154 15	116 1	138 11	110 10	156 11	112 0	152 8	113 13	152 13	107 14	1,856 11	—
			Means -	1,038	12 8	10 3	13 1	9 5	12 15	9 11	11 9	9 3	13 1	9 5	12 11	9 8	12 12	9 0	154 12	22 2

Table IX.—*continued.*

Detailed Record of Food consumed, and Milk yielded, by Cows fed on the Unsewaged and Sewaged Meadow Grass, with Oilcake in addition.

Second Season, 1862 ; 7 days.—June 20 to June 26.

Three Cows.—Unsewaged Grass.

Food consumed.		Friday.	Saturday.	Sunday.	Monday.	Tuesday.	Wednesday.	Thursday.	Total in 7 days.	Per head per day.
Grass	From which Field, Plot and Crop.	Ten-acre, Plot 1, Crop 1.	Ten-acre, Plot 1, Crop 1.	Ten-acre, Plot 1, Crop 1.	Ten-acre, Plot 1, Crop 1.	Ten-acre, Plot 1, Crop 1.	Ten-acre, Plot 1, Crop 1.	Ten-acre, Plot 1, Crop 1.	—	—
	Quantities weighed - -	tons. cwts. qrs. lbs. 0 3 1 11½	tons. cwts. qrs. lbs. 0 4 0 2½	tons. cwts. qrs. lbs. 0 4 2 8½	tons. cwts. qrs. lbs. 0 4 2 9	tons. cwts. qrs. lbs. 0 4 0 8½	tons. cwts. qrs. lbs. 0 3 0 14½	tons. cwts. qrs. lbs. 0 3 1 22½	tons. cwts. qrs. lbs. 1 7 0 21	tons. cwts. qrs. lbs. 0 1 1 5
	Oilcake (equal parts linseed and rape cake) -	0 0 0 9	0 0 0 9	0 0 0 9	0 0 0 9	0 0 0 9	0 0 0 9	0 0 0 9	0 0 2 7	0 0 0 3

Yield of Milk, &c.	Cows. Nos.	Breed.	Years old.	Dates of Calving.	Weights (June 26). lbs.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	—	—
						lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs.	ozs.	lbs. ozs.
	1	Cross Sht.-horn	6	Mar. 20	1,092	15 6	10 8	14 8	11 1	15 12	11 2	15 9	11 0	14 4	10 12	15 4	10 9	14 12	10 8	180	15	25 14
	2	Cross Sht.-horn	7	Dec. 25	1,093	10 8	10 4	11 8	9 0	11 13	10 6	10 4	10 6	10 14	10 3	10 4	10 11	9 11	12 11	148	7	21 3
	3	Cross Sht.-horn	Aged	Feb. 26	976	16 14	11 10	15 12	12 5	16 4	12 1	15 0	11 13	15 12	12 0	15 13	12 8	15 9	11 9	194	14	27 13
				Totals -	3,161	42 12	32 6	41 12	32 6	43 13	33 9	40 13	33 3	40 14	32 15	41 5	33 12	40 0	34 12	524	4	—
				Means -	1,054	14 4	10 13	13 14	10 13	14 10	11 3	13 10	11 1	13 10	11 0	13 12	11 4	13 5	11 9	174	12	24 15

Twelve Cows.—Sewaged Grass.

Food consumed.		Ten-acre, Plot 2, Crop 1.	Ten-acre, Plot 2, Crop 1.	Ten-acre, Plot 2, Crop 1.	Ten-acre, Plot 2, Crop 1.	Ten-acre, Plot 2, Crop 1.	Ten-acre, Plot 2, Crop 1.	Ten-acre, Plot 2, Crop 1.	—	—
Grass	From which Field, Plot, and Crop.									
	Quantities weighed - -	tons. cwts. qrs. lbs. 0 14 0 19	tons. cwts. qrs. lbs. 0 12 1 5	tons. cwts. qrs. lbs. 0 11 3 13	tons. cwts. qrs. lbs. 0 11 3 18	tons. cwts. qrs. lbs. 0 11 3 23	tons. cwts. qrs. lbs. 0 12 1 2	tons. cwts. qrs. lbs. 0 11 0 24	tons. cwts. qrs. lbs. 4 5 2 20	tons. cwts. qrs. lbs. 0 1 0 2
	Oilcake (equal parts linseed and rape cake) -	0 0 1 8	0 0 1 8	0 0 1 8	0 0 1 8	0 0 1 8	0 0 1 8	0 0 1 8	0 2 1 0	0 0 0 3

Yield of Milk, &c.	Cows. Nos.	Breed.	Years old.	Dates of Calving.	Weights (June 26). lbs.	A.M.	P.M.	A.M.	P.M.	A.M	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	—	—
						lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs.	ozs.	lbs. ozs.
	1	Cross Sht.-horn	6	Nov. 18	1,246	12 0	9 5	12 1	8 9	12 0	9 5	11 14	8 12	11 8	9 0	11 6	8 15	11 7	8 12	144	0	20 9
	2	Cross Sht.-horn	8	Feb. 2	1,262	11 1	7 7	11 0	7 14	10 13	7 14	10 11	7 9	10 0	8 0	10 12	7	10 9	7 4	127	15	18 4
	3	Cross Sht.-horn	6	Dec. 1	1,194	10 14	7 12	9 11	7 12	10 11	8 4	10 12	7 9	10 1	8 1	10 9	8 2	10 11	8 3	129	0	18 7
	4	Cross Sht.-horn	Aged	Jan. 26	994	10 11	7 9	10 14	7 13	11 6	7 15	11 3	8 1	11 8	8 0	11 6	7 10	11 2	7 12	132	14	19 0
	5	Cross Sht.-horn	6	Nov. 17	1,158	8 6	6 0	8 2	6 0	7 12	5 10	7 9	5 11	7 6	6 0	7 10	5 2	7 0	5 7	93	11	13 6
	6	Cross Sht.-horn	Aged	Jan. 13	1,126	12 1	8 5	12 3	8 11	12 4	9 0	12 6	8 13	12 8	9 5	12 4	9 9	12 3	9 0	148	8	21 4
	7	Cross Sht.-horn	6	May 2	1,084	19 11	13 2	18 9	13 6	19 11	13 12	18 11	13 4	19 8	13 13	17 0	15 9	18 4	14 1	228	5	32 10
	8	Cross Ayrshire	3	Apr. 13	797	10 8	6 14	10 0	7 0	10 8	7 4	10 6	7 12	10 12	7 2	10 4	7 4	9 8	7 2	122	4	17 7
	9	Cross Sht.-horn	Aged	Feb. 16	1,088	13 1	8 13	11 12	10 4	11 12	10 10	12 5	9 4	13 0	9 4	13 1	8 12	13 1	9 0	153	15	22 0
	10	Ayrshire -	6	Apr. 3	953	17 2	11 5	16 14	11 6	16 8	12 4	16 8	12 2	16 9	11 4	16 12	10 14	15 13	10 12	196	1	28 0
	11	Guernsey -	4	Mar. 30	850	11 11	8 14	12 0	9 8	12 6	9 0	11 12	8 8	10 11	8 3	11 15	8 13	11 9	8 7	143	5	20 8
	12	Cross Sht.-horn	7	Nov. 16	1,142	13 4	8 7	12 11	9 9	12 4	9 4	11 14	8 12	12 6	8 13	12 1	8 12	11 10	7 12	147	7	21 1
				Totals -	12,894	150 6	102 13	145 13	107 12	147 15	110 2	145 15	106 1	145 13	106 15	145 0	106 7	142 13	103 8	1,767	5	—

Table IX.—*continued.*

Detailed Record of Food consumed, and Milk yielded, by Cows fed on the Unsewaged and Sewaged Meadow Grass, with Oilcake in addition.

Second Season, 1862 ; 7 days.—June 27 to July 3.

THREE COWS.—UNSEWAGED GRASS.

		Friday.	Saturday.	Sunday.	Monday.	Tuesday.	Wednesday.	Thursday.	Total in 7 days.	Per head per day.
Food consumed.	From which Field, Plot, and Crop.	Ten-acre, Plot 1, Crop 1.	Ten-acre, Plot 1, Crop 1.	Ten-acre, Plot 1, Crop 1.	Ten-acre, Plot 1, Crop 1.	—	Ten-acre, Plot 1, Crop 1.	—	—	—
Grass	Quantities weighed	tons. cwts. qrs. lbs. 0 3 3 23½	tons. cwts. qrs. lbs. 0 3 1 6½	tons. cwts. qrs. lbs. 0 4 0 20½	tons. cwts. qrs. lbs. 0 3 3 24	tons. cwts. qrs. lbs. 0 0 0 10½	tons. cwts. qrs. lbs. 0 4 0 9½	tons. cwts. qrs. lbs. — 0 0 0 10½	tons. cwts. qrs. lbs. 0 19 2 0	tons. cwts. qrs. lbs. 0 0 3 20
Oilcake (rape-cake)		0 0 0 10½	0 0 0 10½	0 0 0 10½	0 0 0 10½		0 0 0 10½	0 0 2 17½	0 0 0 3½	

Yield of Milk, &c. — Cows. Nos.	Breed.	Years old.	Dates of Calving.	Weights (June 26). lbs.	Friday. A.M.	Friday. P.M.	Saturday. A.M.	Saturday. P.M.	Sunday. A.M.	Sunday. P.M.	Monday. A.M.	Monday. P.M.	Tuesday. A.M.	Tuesday. P.M.	Wednesday. A.M.	Wednesday. P.M.	Thursday. A.M.	Thursday. P.M.	—	—
					lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.
1	Cross Sht.-horn	6	Mar. 20	1,092	16 13	11 1	14 4	10 0	16 6	10 3	14 1	8 15	14 1	9 15	14 3	11 5	14 15	11 11	177 13	25 6
2	Cross Sht.-horn	7	Dec. 25	1,093	8 0	10 7	11 15	9 8	11 1	7 3	10 11	8 6	10 7	11 0	10 6	8 12	10 15	137 7	19 10	
3	Cross Sht.-horn	Aged	Feb. 26	976	15 4	11 0	14 6	12 1	16 14	12 2	15 0	10 4	14 5	12 0	16 0	10 11	16 4	12 1	188 4	26 14
	Totals -			3,161	40 1	32 8	37 6	34 0	42 12	33 6	36 4	29 14	36 12	32 6	41 3	32 6	39 15	34 11	503 8	—
	Means -			1,054	13 6	10 13	12 7	11 5	14 4	11 2	12 1	9 15	12 4	10 13	13 12	10 13	13 5	11 9	167 13	24 0

TWELVE COWS.—SEWAGED GRASS.

		Ten-acre, Plot 2, Crop 1.	Ten-acre, Plot 2, Crop 1.	Ten-acre, Plot 4, Crop 2.	Ten-acre, Plot 00*, Crop 1.	Ten-acre, Plot 4, Crop 2.	Ten-acre, Plot 4, Crop 2.	Ten-acre, Plot 4, Crop 2.	—	—
Food consumed.	From which Field, Plot, and Crop.									
Grass	Quantities weighed	tons. cwts. qrs. lbs. 0 12 3 2	tons. cwts. qrs. lbs. 0 11 3 2	tons. cwts. qrs. lbs. 0 17 2 13	tons. cwts. qrs. lbs. 0 13 0 7	tons. cwts. qrs. lbs. 0 16 3 11	tons. cwts. qrs. lbs. 0 12 1 20	tons. cwts. qrs. lbs. 0 17 2 9	tons. cwts. qrs. lbs. 5 2 0 8	tons. cwts. qrs. lbs. 0 1 0 24
Oilcake (rape-cake)		0 0 1 14	0 0 1 14	0 0 1 14	0 0 1 14	0 0 1 14	0 0 1 14	0 0 1 14	0 2 2 14	0 0 0 3½

Yield of Milk, &c. — Cows. Nos.	Breed.	Years old.	Dates of Calving.	Weights (June 26). lbs.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	—	—
					lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.
1	Cross Sht.-horn	6	Nov. 18	1,246	11 8	8 4	11 0	8 9	11 0	10 2	10 6	7 10	10 11	8 9	11 10	8 9	11 12	8 9	138 4	19 12
2	Cross Sht.-horn	8	Feb. 2	1,262	9 10	7 0	9 4	7 1	9 10	8 0	8 4	6 11	8 10	7 8	9 8	7 2	9 11	7 6	115 5	16 8
3	Cross Sht.-horn	6	Dec. 1	1,194	10 11	8 0	10 6	8 0	11 6	8 4	9 7	7 6	10 0	8 6	11 9	7 9	11 4	8 0	130 4	18 10
4	Cross Sht.-horn	Aged	Jan. 23	994	10 6	7 6	10 6	8 0	10 12	7 15	10 8	7 3	10 6	8 3	11 4	7 11	11 6	7 14	129 4	18 7
5	Cross Sht.-horn	6	Nov. 17	1,158	7 4	5 4	7 3	6 6	7 12	7 6	7 6	5 13	7 10	6 14	8 12	6 6	9 0	6 12	99 12	14 4
6	Cross Sht.-horn	Aged	Jan. 13	1,126	12 5	8 9	12 0	9 1	12 2	10 5	12 0	7 12	12 0	9 6	12 9	8 10	12 11	9 4	148 10	21 4
7	Cross Sht.-horn	6	May 2	1,084	18 1	12 8	17 2	13 1	19 3	13 12	18 4	12 14	19 0	13 15	19 10	13 10	20 2	14 0	225 2	32 3
8	Cross Ayrshire	3	Apr. 13	797	9 4	7 9	9 11	9 9	10 2	7 14	9 12	6 10	10 4	7 11	11 4	7 6	11 8	7 13	126 5	18 1
9	Cross Sht.-horn	Aged	Feb. 16	1,088	12 12	9 10	12 4	11 1	13 2	9 6	10 12	8 4	12 14	9 15	13 9	9 5	14 0	8 13	155 11	22 4
10	Ayrshire -	6	Apr. 3	953	15 14	11 12	16 12	8 3	17 12	12 13	15 4	10 13	16 0	12 9	18 0	11 6	18 8	12 0	197 10	28 4
11	Guernsey -	4	Mar. 30	850	12 1	8 6	12 0	8 4	12 10	9 7	10 4	7 14	11 2	11 2	12 3	9 5	12 15	8 7	146 0	20 14
12	Cross Sht.-horn	7	Nov. 16	1,142	11 8	8 1	11 4	8 6	12 6	9 4	11 8	7 2	11 4	9 9	12 6	8 14	12 0	7 12	141 4	20 3
	Totals -			12,894	141 4	102 5	139 4	105 9	147 13	114 8	133 11	96 0	139 13	113 11	152 4	105 14	154 13	106 10	1,753 7	—
	Means -			1,075	11 12	8 8	11 10	8 13	12 5	9 9	11 2	8 0	11 11	9 8	12 11	8 13	12 14	8 14	146 2	20 14

* Unmeasured land; designated Plot 0 when unsewaged and Plot 00 when sewaged.

Table IX.—*continued.*

Detailed Record of Food consumed, and Milk yielded, by Cows fed on the Unsewaged and Sewaged Meadow Grass, with Oilcake in addition.

Second Season, 1862 ; 7 days.—July 4 to July 10.

		Friday.	Saturday.	Sunday.	Monday.	Tuesday.	Wednesday.	Thursday.	Total in 7 days.	Per head per day.
Three Cows.—Unsewaged Grass.										
Food consumed.	From which Field, Plot, and Crop.	Ten-acre, Plot 1, Crop 1.	Ten-acre, Plot 1, Crop 1.	Ten-acre, Plot 1, Crop 1.	Ten-acre, Plot 1, Crop 1.	Ten-acre, Plot 1, Crop 1.	Ten-acre, Plot 1, Crop 1.	Ten-acre, Plot 1, Crop 1.	—	—
Grass	Quantities weighed	*tons. cwts. grs. lbs.* 0 2 0 21½	*tons. cwts. grs. lbs.* 0 2 2 10½	*tons. cwts. grs. lbs.* 0 3 1 8½	*tons. cwts. grs. lbs.* 0 3 1 9	*tons. cwts. grs. lbs.* 0 3 0 16½	*tons. cwts. grs. lbs.* 0 4 2 23½	*tons. cwts. grs. lbs.* 0 4 0 6½	*tons. cwts. grs. lbs.* 1 3 1 12	*tons. cwts. grs. lbs.* 0 1 0 13
Oilcake (rape-cake)		0 0 0 10½	0 0 0 10½	0 0 0 10½	0 0 0 10½	0 0 0 10½	0 0 0 10½	0 0 0 10½	0 0 2 17½	0 0 0 3¼
Yield of Milk, &c.		A.M. / P.M.	A.M. / P.M.	A.M. / P.M.	A.M. / P.M.	A.M. / P.M.	A.M. / P.M.	A.M. / P.M.	—	—
Cows. Nos.	Breed. Years old. Dates of Calving. Weights (July 10). *lbs.*	*lbs. ozs.* / *lbs. ozs.*	*lbs. ozs.* / *lbs. ozs.*	*lbs. ozs.* / *lbs. ozs.*	*lbs. ozs.* / *lbs. ozs.*	*lbs. ozs.* / *lbs. ozs.*	*lbs. ozs.* / *lbs. ozs.*	*lbs. ozs.* / *lbs. ozs.*	*lbs. ozs.*	*lbs. ozs.*
1	Cross Sht.-horn 6 Mar. 20 1,087	16 0 / 10 13	14 8 / 9 0	14 13 / 10 0	16 14 / 9 8	12 5 / 9 3	14 6 / 11 10	14 10 / 10 5	173 15	24 14
2	Cross Sht.-horn 7 Dec. 25 1,100	9 3 / 10 13	9 10 / 9 1	9 12 / 9 6	7 7 / 10 8	7 1 / 11 5	10 2 / 10 5	9 8 / 8 2	132 3	18 14
3	Cross Sht.-horn Aged Feb. 26 988	16 3 / 11 9	16 6 / 10 11	15 14 / 11 12	15 0 / 9 12	14 8 / 9 12	16 1 / 11 0	16 14 / 11 6	186 12	26 11
	Totals - 3,175	41 6 / 33 3	40 8 / 28 12	40 7 / 31 2	39 5 / 29 12	33 14 / 30 4	40 9 / 32 15	41 0 / 29 13	492 14	—
	Means - 1,058	13 13 / 11 1	13 8 / 9 9	13 8 / 10 6	13 2 / 9 15	11 5 / 10 1	13 8 / 11 0	13 10 / 9 15	164 5	23 8
Twelve Cows.—Sewaged Grass.										
Food consumed.	From which Field, Plot, and Crop.	Ten-acre, Plot 4, Crop 2.	Ten-acre, Plot 4, Crop 2.	Ten-acre, Plot 4, Crop 2.	Ten-acre, Plot 4, Crop 2.	Ten-acre, Plot 4, Crop 2.	Ten-acre, Plot 4, Crop 2.	Ten-acre, Plot 4, Crop 2.	—	—
Grass	Quantities weighed	*tons. cwts. grs. lbs.* 0 14 3 25	*tons. cwts. grs. lbs.* 0 7 0 23	*tons. cwts. grs. lbs.* 0 15 0 17	*tons. cwts. grs. lbs.* 0 15 0 25	*tons. cwts. grs. lbs.* 0 16 1 6	*tons. cwts. grs. lbs.* 0 16 1 11	*tons. cwts. grs. lbs.* 0 17 2 19	*tons. cwts. grs. lbs.* 5 2 3 14	*tons. cwts. grs. lbs.* 0 1 0 25
Oilcake (rape-cake)		0 0 1 14	0 0 1 14	0 0 1 14	0 0 1 14	0 0 1 14	0 0 1 14	0 0 1 14	0 2 2 14	0 0 0 3½
Yield of Milk, &c.		A.M. / P.M.	A.M. / P.M.	A.M. / P.M.	A.M. / P.M.	A.M. / P.M.	A.M. / P.M.	A.M. / P.M.	—	—
Cows. Nos.	Breed. Years old. Dates of Calving. Weights (July 10). *lbs.*	*lbs. ozs.* / *lbs. ozs.*	*lbs. ozs.* / *lbs. ozs.*	*lbs. ozs.* / *lbs. ozs.*	*lbs. ozs.* / *lbs. ozs.*	*lbs. ozs.* / *lbs. ozs.*	*lbs. ozs.* / *lbs. ozs.*	*lbs. ozs.* / *lbs. ozs.*	*lbs. ozs.*	*lbs. ozs.*
1	Cross Sht.-horn 6 Nov. 18 1,190	11 13 / 8 10	11 6 / 8 10	12 0 / 10 0	11 2 / 8 12	11 13 / 8 5	11 2 / 9 5	11 15 / 8 6	143 3	20 7
2	Cross Sht.-horn 8 Feb. 2 1,263	9 0 / 7 12	9 12 / 7 0	9 4 / 7 6	9 12 / 7 0	9 0 / 7 0	9 12 / 7 3	9 10 / 7 5	116 12	16 11
3	Cross Sht.-horn 6 Dec. 1 1,204	11 0 / 8 5	10 11 / 8 2	11 2 / 9 3	10 13 / 8 4	11 0 / 8 5	11 6 / 8 8	11 9 / 8 7	136 11	19 8
4	Cross Sht.-horn Aged Jan. 26 983	11 10 / 8 4	11 6 / 7 10	11 6 / 8 9	10 10 / 8 2	11 2 / 8 9	12 4 / 8 11	12 3 / 8 9	138 15	19 14
5	Cross Sht.-horn 6 Nov. 17 1,132	8 6 / 7 2	9 2 / 7 2	9 4 / 7 13	8 6 / 7 0	8 4 / 6 13	9 3 / 6 12	8 6 / 6 14	110 7	15 12
6	Cross Sht.-horn Aged Jan. 13 1,118	12 2 / 9 0	12 10 / 9 11	12 13 / 9 8	12 4 / 8 4	12 3 / 8 13	12 10 / 9 12	12 10 / 9 2	151 6	21 10
7	Cross Sht.-horn 6 May 2 1,089	19 8 / 13 15	19 4 / 14 8	19 7 / 15 2	18 8 / 13 0	18 15 / 14 0	18 14 / 14 4	19 0 / 14 8	232 13	33 4
8	Cross Ayrshire 3 Apr. 13 822	11 9 / 7 11	11 0 / 8 4	11 12 / 8 6	11 0 / 7 3	10 14 / 7 12	11 10 / 8 0	11 14 / 7 13	134 6	19 3
9	Cross Sht.-horn Aged Feb. 16 1,082	13 0 / 9 9	12 13 / 9 10	12 11 / 10 8	13 0 / 8 9	12 8 / 9 4	12 11 / 9 15	12 14 / 9 4	158 4	22 5
10	Ayrshire 6 Apr. 3 918	18 2 / 11 14	18 2 / 12 3	18 0 / 13 1	16 4 / 11 0	16 12 / 11 12	17 6 / 12 10	17 8 / 11 15	206 9	29 8
11	Guernsey 4 Mar. 30 828	11 12 / 8 15	12 10 / 9 7	12 2 / 9 10	11 4 / 8 4	12 1 / 9 7	12 4 / 9 11	12 1 / 9 12	149 4	21 5
12	Cross Sht.-horn 7 Nov. 16 1,116	12 14 / 8 13	13 0 / 8 14	13 1 / 8 1	12 6 / 8 2	11 13 / 9 0	14 5 / 9 2	13 6 / 9 1	151 14	21 11
	Totals - 12,755	150 12 / 109 14	151 12 / 111 1	152 14 / 116 13	145 5 / 103 8	146 5 / 109 0	153 7 / 113 13	153 0 / 111 0	1,828 8	—
	Means - 1,063	12 9 / 9 3	12 10 / 9 4	12 12 / 9 12	12 2 / 8 10	12 3 / 9 1	12 12 / 9 8	12 12 / 9 4	152 6	21 12

Table IX.—*continued.*

Detailed Record of Food consumed, and Milk yielded, by Cows fed on the Unsewaged and Sewaged Meadow Grass, with Oilcake in addition.

Second Season, 1862 ; 7 days.—July 11 to July 17.

Three Cows.—Unsewaged Grass.

Food consumed.		Friday.	Saturday.	Sunday.	Monday.	Tuesday.	Wednesday.	Thursday.	Total in 7 days.	Per head per day.
Grass	From which Field, Plot, and Crop.	—	Ten-acre, Plot 1, Crop 1.	Ten-acre, Plot 1, Crop 1.	Ten-acre, Plot 1, Crop 1.	Ten-acre, Plot 1, Crop 1.	Ten-acre, Plot 0*, Crop 1.	Ten-acre, Plot 0*, Crop 1.	—	—
	Quantities weighed	tons. cwts. qrs. lbs. ..	tons. cwts. qrs. lbs. 0 2 1 24½	tons. cwts. qrs. lbs. 0 2 2 12½	tons. cwts. qrs. lbs. 0 2 2 9	tons. cwts. qrs. lbs. 0 2 1 25	tons. cwts. qrs. lbs. 0 2 0 25½	tons. cwts. qrs. lbs. 0 2 1 21½	tons. cwts. qrs. lbs. 0 14 3 6	tons. cwts. qrs. lbs. 0 0 2 23
Oilcake (1 part linseed and 3½ parts rape cake)		0 0 0 13½	0 0 0 13½	0 0 0 13½	0 0 0 13½	0 0 0 13½	0 0 0 13½	0 0 0 13½	0 0 3 10½	0 0 0 4½

Yield of Milk, &c.	Cows. Nos.	Breed.	Years old.	Dates of Calving.	Weights (July10). lbs.	Friday. A.M.	Friday. P.M.	Saturday. A.M.	Saturday. P.M.	Sunday. A.M.	Sunday. P.M.	Monday. A.M.	Monday. P.M.	Tuesday. A.M.	Tuesday. P.M.	Wednesday. A.M.	Wednesday. P.M.	Thursday. A.M.	Thursday. P.M.	Total in 7 days.	Per head per day.
						lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.
	1	Cross Sht.-horn	6	Mar. 20	1,087	14 10	9 4	13 2	9 12	13 7	10 9	15 0	10 5	14 10	10 1	14 12	10 0	13 11	9 4	168 7	24 1
	2	Cross Sht.-horn	7	Dec. 25	1,100	9 2	9 15	9 7	9 15	8 12	10 1	11 0	7 13	9 0	10 12	8 7	9 1	8 8	9 0	130 13	18 11
	3	Cross Sht.-horn	Aged	Feb. 26	988	13 8	12 6	13 6	10 8	15 1	11 5	16 2	11 2	14 5	11 0	15 4	11 0	15 0	10 2	180 1	25 12
		Totals -			3,175	37 4	31 9	35 15	30 3	37 4	31 15	42 2	29 4	37 15	31 13	38 7	30 1	37 3	28 6	479 5	—
		Means -			1,058	12 7	10 8	12 0	10 1	12 7	10 10	14 1	9 12	12 10	10 10	12 13	10 0	12 6	9 7	159 12	22 13

Twelve Cows.—Sewaged Grass.

Food consumed.		Friday.	Saturday.	Sunday.	Monday.	Tuesday.	Wednesday.	Thursday.	Total in 7 days.	Per head per day.
Grass	From which Field, Plot, and Crop.	Ten-acre, Plot 4, Crop 2.	Ten-acre, Plot 4, Crop 2.	Ten-acre, Plot 4, Crop 2.	Ten-acre, Plot 3, Crop 2.	Ten-acre, Plot 3, Crop 2.	Ten-acre, Plot 3, Crop 2.	Ten-acre, Plot 3, Crop 2.	—	—
	Quantities weighed	tons. cwts. qrs. lbs. 0 15 2 12	tons. cwts. qrs. lbs. 0 15 2 21	tons. cwts. qrs. lbs. 0 6 3 9	tons. cwts. qrs. lbs. 1 6 2 11	tons. cwts. qrs. lbs. 0 11 3 23	tons. cwts. qrs. lbs. 0 14 1 3	tons. cwts. qrs. lbs. 0 17 3 7	tons. cwts. qrs. lbs. 5 8 3 2	tons. cwts. qrs. lbs. 0 1 1 5
Oilcake (1 part linseed and 3½ parts rape cake)		0 0 1 26	0 0 1 26	0 0 1 26	0 0 1 26	0 0 1 26	0 0 1 26	0 0 1 26	0 3 1 14	0 0 0 4½

Yield of Milk, &c.	Cows. Nos.	Breed	Years old.	Dates of Calving.	Weights (July10). lbs.	Friday. A.M.	Friday. P.M.	Saturday. A.M.	Saturday. P.M.	Sunday. A.M.	Sunday. P.M.	Monday. A.M.	Monday. P.M.	Tuesday. A.M.	Tuesday. P.M.	Wednesday. A.M.	Wednesday. P.M.	Thursday. A.M.	Thursday. P.M.	Total in 7 days.	Per head per day.
						lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.
	1	Cross Sht.-horn	6	Nov. 18	1,190	11 12	8 4	11 10	8 10	11 12	6 13	13 1	7 10	12 2	8 12	11 6	9 4	12 3	9 0	142 3	20 5
	2	Cross Sht.-horn	8	Feb. 2	1,263	10 7	7 2	9 3	7 8	9 8	6 13	9 5	6 12	10 0	7 1	8 10	7 2	9 6	6 10	115 7	16 8
	3	Cross Sht.-horn	6	Dec. 1	1,204	10 11	8 0	10 8	8 7	11 6	8 12	11 2	8 11	10 8	8 9	11 3	9 0	11 0	8 14	136 11	19 8
	4	Cross Sht.-horn	Aged	Jan. 26	983	11 6	7 6	11 3	8 0	11 12	8 12	11 8	8 7	11 3	8 12	11 12	8 4	11 0	8 0	137 5	19 10
	5	Cross Sht.-horn	6	Nov. 17	1,132	8 12	6 3	7 11	7 7	8 2	6 13	8 6	7 7	7 6	7 4	9 6	6 14	8 4	6 12	106 11	15 4
	6	Cross Sht.-horn	Aged	Jan. 13	1,118	12 14	8 1	12 4	9 3	12 10	6 6	13 10	8 6	11 0	9 6	12 13	9 2	12 7	9 4	147 6	21 1
	7	Cross Sht.-horn	6	May 2	1,099	20 0	11 9	19 2	12 4	19 0	13 13	19 6	14 8	17 10	14 0	19 6	13 13	19 1	11 4	224 12	32 2
	8	Cross Ayrshire	3	Apl. 13	822	12 5	7 1	11 8	7 15	11 8	8 3	11 7	8 1	10 9	8 6	11 6	7 13	11 12	7 14	135 12	19 6
	9	Cross Sht.-horn	Aged	Feb. 16	1,082	12 15	8 10	12 6	10 12	12 2	9 1	12 2	8 9	11 10	9 10	13 2	9 0	12 8	8 12	151 3	21 10
	10	Ayrshire -	6	Apl. 3	918	17 11	10 10	16 7	12 0	17 9	12 4	17 12	10 12	15 6	12 10	18 6	12 13	18 2	12 11	205 1	29 5
	11	Guernsey -	4	Mar. 30	828	13 0	8 5	12 9	9 0	12 15	9 15	12 8	9 14	11 8	9 6	12 0	9 10	12 15	9 10	153 3	21 14
	12	Cross Sht.-horn	7	Nov. 16	1,116	13 1	7 12	11 6	8 7	12 6	8 13	11 5	8 10	11 7	8 12	12 8	8 14	12 13	8 12	144 14	20 11
		Totals -			12,755	154 14	98 15	145 13	109 9	150 10	106 6	151 8	107 11	140 5	112 8	151 14	111 9	151 7	107 7	1,800 8	—
		Means -			1,063	12 15	8 4	12 2	9 2	12 9	8 14	12 10	9 0	11 11	9 6	12 10	9 5	12 10	8 15	150 1	21 7

Table IX.—*continued.*

Detailed Record of Food consumed, and Milk yielded, by Cows fed on the Unsewaged and Sewaged Meadow Grass, with Oilcake in addition.

Second Season, 1862 ; 7 days.—July 18 to July 24.

Three Cows.—Unsewaged Grass.

Food consumed		Friday.	Saturday.	Sunday.	Monday.	Tuesday.	Wednesday.	Thursday.	Total in 7 days.	Per head per day.
Grass	From which Field, Plot, and Crop.	Ten-acre, Plot 0,* Crop 1.	—	Ten-acre, Plot 0,* Crop 1.	Ten-acre, Plot 0,* Crop 1.	Ten-acre, Plot 0,* Crop 1.	†	Ten-acre, Plot 0,* Crop 1.	—	—
	Quantities weighed	0 3 0 18½	..	0 1 1 13	0 1 1 14	0 2 2 2	0 1 3 15	0 3 2 16	0 13 3 22½	0 0 2 18
Oilcake (1 part linseed and 3½ parts rape cake)		0 0 0 13½	0 0 0 13½	0 0 0 13½	0 0 0 13½	0 0 0 13½	0 0 0 13½	0 0 0 13½	0 0 3 10½	0 0 0 4½

Yield of Milk, &c.	Cows. Nos.	Breed.	Years old.	Dates of Calving.	Weights (July 24). lbs.	A.M. lbs.	A.M. ozs.	P.M. lbs.	P.M. ozs.	A.M. lbs.	A.M. ozs.	P.M. lbs.	P.M. ozs.	A.M. lbs.	A.M. ozs.	P.M. lbs.	P.M. ozs.	A.M. lbs.	A.M. ozs.	P.M. lbs.	P.M. ozs.	A.M. lbs.	A.M. ozs.	P.M. lbs.	P.M. ozs.	A.M. lbs.	A.M. ozs.	P.M. lbs.	P.M. ozs.	— lbs.	— ozs.	— lbs.	— ozs.
	1	Cross Sht.-horn	6	Mar. 20	1,090	14	0	9	0	14	0	9	14	14	10	9	13	13	3	9	2	13	2	8	14	14	2	10	0	14	8	9	11	163	15	23	7
	2	Cross Sht.-horn	7	Dec. 25	1,127	9	1	9	8	8	0	7	12	8	2	9	0	5	3	10	12	6	5	9	9	8	6	9	10	8	14	8	8	118	10	16	15
	3	Cross Sht.-horn	Aged	Feb. 26	1,011	14	12	10	9	15	6	10	12	14	10	11	0	15	0	10	4	14	15	10	11	15	2	11	10	15	12	11	15	182	6	26	1
				Totals -	3,228	37	13	29	1	37	6	28	6	37	6	29	13	33	6	30	2	34	6	29	2	37	10	31	4	39	2	30	2	464	15	—	
				Means -	1,076	12	10	9	11	12	7	9	7	12	7	9	15	11	2	10	1	11	7	9	11	12	9	10	7	13	1	10	1	155	0	22	2

Twelve Cows.—Sewaged Grass.

Food consumed		Friday.	Saturday.	Sunday.	Monday.	Tuesday.	Wednesday.	Thursday.	Total in 7 days.	Per head per day.
Grass	From which Field, Plot, and Crop.	Ten-acre, Plot 3, Crop 2.	Ten-acre, Plot 3, Crop 2.	Ten-acre, Plots 2 and 3, Crop 2.	Ten-acre, Plots 2 and 3, Crop 2.	†	†	†	—	—
	Quantities weighed	0 13 1 27	0 15 3 12	0 13 3 27	0 13 3 27	0 7 3 22	0 10 0 0	0 18 2 14	4 13 3 26	0 1 0 13
Oilcake (1 part linseed and 3½ parts rape cake)		0 0 1 26	0 0 1 26	0 0 1 26	0 0 1 26	0 0 1 26	0 0 1 26	0 0 1 26	0 3 1 14	0 0 0 4½

Yield of Milk, &c.	Cows. Nos.	Breed.	Years old.	Dates of Calving.	Weights (July 24). lbs.	A.M. lbs.	A.M. ozs.	P.M. lbs.	P.M. ozs.	A.M. lbs.	A.M. ozs.	P.M. lbs.	P.M. ozs.	A.M. lbs.	A.M. ozs.	P.M. lbs.	P.M. ozs.	A.M. lbs.	A.M. ozs.	P.M. lbs.	P.M. ozs.	A.M. lbs.	A.M. ozs.	P.M. lbs.	P.M. ozs.	A.M. lbs.	A.M. ozs.	P.M. lbs.	P.M. ozs.	— lbs.	— ozs.	— lbs.	— ozs.
	1	Cross Sht.-horn	6	Nov. 18	1,192	11	12	9	2	12	1	8	10	11	14	9	6	11	2	9	0	11	8	9	3	11	12	8	12	12	0	8	4	144	5	20	10
	2	Cross Sht.-horn	8	Feb. 2	1,246	9	2	6	4	7	12	6	0	7	13	6	14	8	12	6	4	8	14	7	0	8	14	6	10	8	11	7	1	105	15	15	2
	3	Cross Sht.-horn	6	Dec. 1	1,232	10	13	8	5	11	10	8	4	11	9	8	14	11	0	8	1	10	13	8	3	11	3	7	8	11	0	8	9	135	12	19	6
	4	Cross Sht.-horn	Aged	Jan. 26	1,000	10	12	8	9	10	14	7	12	10	12	6	15	10	3	7	10	10	10	8	2	11	1	8	1	11	6	7	10	130	5	18	10
	5	Cross Sht.-horn	6	Nov. 17	1,176	7	14	7	3	8	10	5	12	8	5	6	6	7	8	7	2	8	4	6	10	8	12	7	0	8	12	6	7	104	9	14	15
	6	Cross Sht.-horn	Aged	Jan. 13	1,121	12	4	8	5	12	7	8	15	12	15	9	8	12	4	9	1	12	12	9	5	12	2	9	6	12	2	9	8	150	14	21	9
	7	Cross Sht.-horn	6	May 2	1,071	17	0	14	13	18	14	13	0	17	8	12	4	18	13	13	0	18	2	12	2	18	6	12	4	18	12	11	11	216	9	30	15
	8	Cross Ayrshire	3	Apr. 13	824	11	4	7	15	12	0	7	13	10	7	7	3	10	14	7	1	10	0	6	4	9	10	6	10	10	14	7	9	125	8	17	15
	9	Cross Sht.-horn	Aged	Feb. 16	1,116	12	8	9	6	12	2	9	13	12	6	9	12	12	10	9	11	12	10	9	5	12	11	9	1	12	15	9	7	154	5	22	1
	10	Ayrshire -	6	Apr. 3	952	17	2	11	12	18	0	12	4	17	4	12	1	17	13	12	4	16	14	12	5	16	12	12	4	18	0	12	5	207	0	29	9
	11	Guernsey -	4	Mar. 30	854	12	4	9	6	12	13	8	11	12	13	10	1	12	8	9	5	12	11	9	14	12	10	9	4	12	11	9	8	154	7	22	1
	12	Cross Sht.-horn	7	Nov. 16	1,162	12	11	8	8	12	9	8	7	12	0	8	8	12	6	9	1	12	13	8	14	12	14	8	8	12	0	9	5	148	8	21	3
				Totals -	12,946	145	6	109	8	149	12	105	5	145	10	107	12	145	13	107	8	145	15	107	2	146	11	105	4	149	3	107	4	1,778	1	—	
				Means -	1,079	12	2	9	2	12	8	8	12	12	2	9	0	12	2	8	15	12	3	8	15	12	4	8	12	12	7	8	15	148	3	21	2

Table IX.—*continued.*

Detailed Record of Food consumed, and Milk yielded, by Cows fed on the Unsewaged and Sewaged Meadow Grass, with Oilcake in addition.

Second Season, 1862 ; 7 days.—July 25 to July 31.

Three Cows.—Unsewaged Grass.

		Friday.	Saturday.	Sunday.	Monday.	Tuesday.	Wednesday.	Thursday.	Total in 7 days.	Per head per day.
Food consumed.	From which Field, Plot, and Crop.	Ten-acre, Plot 0,* Crop 2.	Ten-acre, Plot 0,* Crop 2.	Ten-acre, Plot 0,* Crop 2.	Ten-acre, Plot 0,* Crop 2.	†	†	†	—	—
Grass	Quantities weighed	tons. cwts. qrs. lbs. 0 4 3 16	tons. cwts. qrs. lbs. 0 3 3 24	tons. cwts. qrs. lbs. 0 3 1 23	tons. cwts. qrs. lbs. 0 3 1 23	tons. cwts. qrs. lbs. 0 5 2 6	tons. cwts. qrs. lbs. 0 4 2 10	tons. cwts. qrs. lbs. 0 4 0 21	tons. cwts. qrs. lbs. 1 10 0 11	tons. cwts. qrs. lbs. 0 1 1 21
Oilcake (rape-cake)		0 0 0 12	0 0 0 12	0 0 0 12	0 0 0 12	0 0 0 12	0 0 0 12	0 0 0 12	0 0 3 0	0 0 0 4

Cows. Nos.	Breed.	Years old.	Dates of Calving.	Weights (July 24) lbs.	Friday A.M.	Friday P.M.	Saturday A.M.	Saturday P.M.	Sunday A.M.	Sunday P.M.	Monday A.M.	Monday P.M.	Tuesday A.M.	Tuesday P.M.	Wednesday A.M.	Wednesday P.M.	Thursday A.M.	Thursday P.M.	—	—
Yield of Milk, &c.					lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs.	lbs. ozs.
1	Cross Sht.-horn	6	Mar. 20	1,090	14 1	10 9	14 6	10 4	14 0	13 4	13 8	10 0	14 9	10 11	15 2	11 3	15 0	10 8	177 1	25 5
2	Cross Sht.-horn	7	Dec. 25	1,127	8 2	9 11	9 8	9 6	8 1	11 14	7 10	9 4	8 15	9 8	8 7	9 0	7 4	9 12	126 6	18 1
3	Cross Sht.-horn	Aged	Feb. 26	1,011	15 7	11 8	16 8	11 1	15 4	10 15	14 0	10 6	15 11	11 5	16 2	10 6	15 9	11 1	185 3	26 7
		Totals -		3,228	37 10	31 12	40 6	30 11	37 5	36 1	35 2	29 10	39 3	31 8	39 11	30 9	37 13	31 5	488 10	—
		Means -		1,076	12 9	10 9	13 7	10 4	12 7	12 0	11 11	9 14	13 1	10 8	13 4	10 3	12 10	10 7	162 14	23 4

Twelve Cows.—Sewaged Grass.

		Friday.	Saturday.	Sunday.	Monday.	Tuesday.	Wednesday.	Thursday.	Total in 7 days.	Per head per day.
Food consumed.	From which Field, Plot, and Crop.	Ten-acre, Plots 00* and 2, Crop 2.	Ten-acre, Plot 00*, Crop 2.	‡	‡	‡	‡	Five-acre, Plot 4, Crop 2.	—	—
Grass	Quantities weighed	tons. cwts. qrs. lbs. 0 13 1 6	tons. cwts. qrs. lbs. 0 11 1 24	tons. cwts. qrs. lbs. 0 10 1 22	tons. cwts. qrs. lbs. 0 10 1 22	tons. cwts. qrs. lbs. 0 14 0 14	tons. cwts. qrs. lbs. 0 12 2 0	tons. cwts. qrs. lbs. 0 12 0 25	tons. cwts. qrs. lbs. 4 4 2 1	tons. cwts. qrs. lbs. 0 1 0 1
Oilcake (rape-cake)		0 0 1 20	0 0 1 20	0 0 1 20	0 0 1 20	0 0 1 20	0 0 1 20	0 3 0 0	0 0 0 4	

Cows. Nos.	Breed.	Years old.	Dates of Calving.	Weights (July 24). lbs.	Friday A.M.	Friday P.M.	Saturday A.M.	Saturday P.M.	Sunday A.M.	Sunday P.M.	Monday A.M.	Monday P.M.	Tuesday A.M.	Tuesday P.M.	Wednesday A.M.	Wednesday P.M.	Thursday A.M.	Thursday P.M.	—	—
Yield of Milk, &c.					lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.
1	Cross Sht.-horn	6	Nov. 18	1,192	11 8	8 8	11 12	9 0	11 10	9 7	10 12	8 9	11 11	9 6	11 12	9 0	11 8	8 7	142 14	20 7
2	Cross Sht.-horn	8	Feb. 2	1,246	9 4	6 7	9 2	6 8	8 12	6 2	9 2	6 0	8 10	7 0	9 11	6 8	8 10	6 4	108 0	15 7
3	Cross Sht.-horn	6	Dec. 1	1,232	10 11	7 7	11 0	7 14	11 2	8 0	10 0	7 6	10 6	8 2	10 14	7 8	10 4	7 8	128 2	18 5
4	Cross Sht.-horn	Aged	Jan. 26	1,000	11 12	7 11	11 10	7 7	11 11	7 4	9 12	7 10	11 6	7 8	11 0	7 12	11 2	7 9	131 2	18 12
5	Cross Sht.-horn	6	Nov. 17	1,176	8 11	6 0	8 10	7 4	8 7	6 15	8 2	6 3	8 7	7 3	7 12	7 6	8 6	6 4	105 10	15 1
6	Cross Sht.-horn	Aged	Jan. 13	1,121	12 15	8 13	12 6	9 12	12 2	9 13	12 0	9 2	12 7	9 12	12 0	8 10	12 2	9 0	150 14	21 9
7	Cross Sht.-horn	6	May 2	1,071	20 2	11 11	19 12	13 3	19 1	13 13	17 13	13 0	19 12	13 13	18 8	13 2	18 0	13 4	224 14	32 2
8	Cross Ayrshire	3	Apr. 13	824	11 12	8 1	12 4	8 0	11 12	7 15	11 10	8 1	11 5	8 0	10 12	7 0	10 12	7 12	135 0	19 5
9	Cross Sht.-horn	Aged	Feb. 16	1,116	12 1	8 11	12 7	9 7	12 15	12 14	11 6	8 12	11 7	9 3	11 14	8 6	12 1	9 10	151 2	21 9
10	Ayrshire -	6	Apr. 3	952	17 8	11 4	16 12	11 13	17 0	12 13	17 8	11 9	17 5	12 4	17 3	12 1	16 8	12 14	204 6	29 3
11	Guernsey -	4	Mar. 30	854	13 7	9 4	13 10	8 14	12 10	9 3	13 7	8 10	13 1	9 2	13 4	8 6	12 10	8 10	154 2	22 0
12	Cross Sht.-horn	7	Nov. 16	1,162	12 7	8 15	12 8	8 4	12 0	8 7	11 4	8 15	12 2	8 6	12 12	7 6	11 10	8 0	143 0	20 7
		Totals -		12,946	152 2	102 12	151 13	107 6	149 2	112 10	142 12	103 13	147 15	109 11	147 6	103 1	143 9	105 2	1,779 2	—
		Means -		1,079	12 11	8 9	12 11	8 15	12 7	9 6	11 14	8 11	12 5	9 2	12 5	8 9	11 15	8 12	148 4	21 3

Table IX.—*continued.*

Detailed Record of Food consumed, and Milk yielded, by Cows fed on the Unsewaged and Sewaged Meadow Grass, with Oilcake in addition.

Second Season, 1862 ; 7 days.—August 1 to August 7.

Three Cows.—Unsewaged Grass.

		Friday,	Saturday.	Sunday.	Monday.	Tuesday.	Wednesday.	Thurday.	Total in 7 days.	Per head per day.
Food consumed.	From which Field, Plot, and Crop	Five-acre, Plot 1, Crop 1.	Five-acre, Plot 1, Crop 1.	—	—	Ten-acre, Plot 0*, Crop 2.	Ten-acre, Plot 0*, Crop 2.	—	—	—
Grass	Quantities weighed	*tons.* *cwts.* *qrs.* *lbs.* 0 2 1 17	*tons.* *cwts.* *qrs.* *lbs.* 0 1 2 22	*tons.* *cwts.* *qrs.* *lbs.* – – – –	*tons.* *cwts.* *qrs.* *lbs.* – – – –	*tons.* *cwts.* *qrs.* *lbs.* 0 6 0 3	*tons.* *cwts.* *qrs.* *lbs.* 0 5 3 24	*tons.* *cwts.* *qrs.* *lbs.* – – – –	*tons.* *cwts.* *qrs.* *lbs.* 0 16 0 10	*tons.* *cwts.* *qrs.* *lbs.* 0 0 3 2
Oilcake		0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0

Yield of Milk, &c.	Cows. Nos.	Breed.	Years old.	Dates of Calving.	Weights (July 24). *lbs.*	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	—	—
						lbs. *ozs.*	*lbs.* *ozs.*	*lbs.* *ozs.*	*lbs.* *ozs.*	*lbs.* *ozs.*	*lbs.* *ozs.*	*lbs.* *ozs.*	*lbs.* *ozs.*	*lbs.* *ozs.*	*lbs.* *ozs.*	*lbs.* *ozs.*	*lbs.* *ozs.*	*lbs.* *ozs.*	*lbs.* *ozs.*	*lbs.*	*lbs.* *ozs.*
	1	Cross Sht.-horn	6	Mar. 20	1,090	15 9	10 1	12 8	8 12	12 14	8 11	13 10	9 6	13 4	9 11	14 3	9 8	14 2	10 9	162 12	23 4
	2	Cross Sht.-horn	7	Dec. 25	1,127	7 11	9 0	5 0	5 11	6 8	9 1	6 4	8 3	7 2	7 12	8 2	7 0	9 0	7 11	104 1	14 14
	3	Cross Sht.-horn	Aged	Feb. 26	1,011	16 9	10 0	13 4	11 2	14 0	10 1	15 4	9 4	14 6	10 5	16 0	10 6	15 8	11 2	177 3	25 5
			Totals	-	3,228	39 13	29 1	30 12	25 9	33 6	27 13	35 2	26 13	34 12	27 12	38 5	26 14	38 10	29 6	444 0	—
			Means	-	1,076	13 4	9 11	10 4	8 9	11 2	9 4	11 12	8 15	11 9	9 4	12 12	8 15	12 14	9 13	148 0	21 2

Twelve Cows.—Sewaged Grass.

		Friday,	Saturday.	Sunday.	Monday.	Tuesday.	Wednesday.	Thurday.	Total in 7 days.	Per head per day.
Food consumed.	From which Field, Plot, and Crop	Five-acre, Plot 4, Crop 2.	Five-acre, Plot 4, Crop 2.	Five-acre, Plot 4, Crop 2.	†	†	†	†	—	—
Grass	Quantities weighed	*tons.* *cwts.* *qrs.* *lbs.* 0 9 3 10	*tons.* *cwts.* *qrs.* *lbs.* 0 9 3 5	*tons.* *cwts.* *qrs.* *lbs.* 0 11 3 8	*tons.* *cwts.* *qrs.* *lbs.* 0 9 1 22	*tons.* *cwts.* *qrs.* *lbs.* 0 14 2 2	*tons.* *cwts.* *qrs.* *lbs.* 0 17 2 14	*tons.* *cwts.* *qrs.* *lbs.* 0 10 3 27	*tons.* *cwts.* *qrs.* *lbs.* 4 4 0 4	*tons.* *cwts.* *qrs.* *lbs.* 0 1 0 0
Oilcake		0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0

Yield of Milk, &c.	Cows. Nos.	Breed.	Years old.	Dates of Calving.	Weights (July 24). *lbs.*	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	—	—
						lbs. *ozs.*	*lbs.* *ozs.*	*lbs.* *ozs.*	*lbs.* *ozs.*	*lbs.* *ozs.*	*lbs.* *ozs.*	*lbs.* *ozs.*	*lbs.* *ozs.*	*lbs.* *ozs.*	*lbs.* *ozs.*	*lbs.* *ozs.*	*lbs.* *ozs.*	*lbs.* *ozs.*	*lbs.* *ozs.*	*lbs.*	*lbs.* *ozs.*
	1	Cross Sht.-horn	6	Nov. 18	1,192	11 14	8 2	11 8	8 10	11 10	9 1	12 0	9 0	11 9	8 14	12 0	9 1	11 7	8 8	142 12	20 6
	2	Cross Sht.-horn	8	Feb. 2	1,246	8 9	6 7	8 7	6 0	7 12	6 10	8 2	5 14	8 0	6 5	8 12	6 14	8 8	6 10	102 14	14 11
	3	Cross Sht.-horn	6	Dec. 1	1,232	10 5	7 8	10 3	7 6	10 2	8 1	11 0	7 14	10 1	7 6	10 11	7 0	10 2	7 1	124 12	17 13
	4	Cross Sht.-horn	Aged	Jan. 26	1,000	10 10	7 9	11 14	8 4	11 1	8 2	11 2	7 4	10 4	8 3	11 12	7 14	11 5	8 4	133 8	19 1
	5	Cross Sht.-horn	6	Nov. 17	1,176	9 2	6 8	7 14	6 10	7 14	6 5	8 12	6 4	7 6	6 8	9 1	6 8	8 11	6 12	104 3	14 14
	6	Cross Sht.-horn	Aged	Jan. 13	1,121	12 3	9 3	12 5	8 12	12 2	9 11	13 3	9 1	12 7	8 11	12 4	8 13	12 4	9 0	149 15	21 7
	7	Cross Sht.-horn	6	May 2	1,071	18 15	13 3	18 14	14 9	18 1	14 2	19 12	14 0	18 3	13 10	19 0	7 12	18 6	12 13	221 4	31 10
	8	Cross Ayrshire	3	Apr. 13	824	12 0	7 14	11 7	8 5	11 12	8 14	13 0	8 4	11 2	8 6	11 12	9 3	12 4	7 15	142 2	20 5
	9	Cross Sht.-horn	Aged	Feb. 16	1,116	11 12	9 6	11 8	9 8	10 2	9 13	11 4	7 15	10 3	9 11	11 14	8 11	10 15	9 8	142 2	20 5
	10	Ayrshire -	6	Apr. 3	952	17 12	11 7	17 5	12 7	17 1	11 14	18 7	12 2	16 15	12 3	17 8	12 13	18 3	11 11	207 12	29 11
	11	Guernsey -	4	Mar. 30	854	13 9	9 10	12 10	10 1	12 13	10 3	14 0	8 9	11 8	8 6	11 3	9 4	11 11	9 4	152 11	21 13
	12	Cross Sht.-horn	7	Nov. 16	1,162	13 3	8 11	11 8	8 15	11 11	8 10	12 0	7 9	10 6	8 3	12 2	8 7	12 0	8 6	141 11	20 4
			Totals	-	12,946	149 14	105 8	145 7	109 7	142 1	111 6	152 10	103 12	138 0	106 6	147 15	101 12	145 12	105 12	1,765 10	—
			Means	-	1,079	12 8	8 13	12 2	9 2	11 13	9 4	12 12	8 10	11 8	8 14	12 5	8 8	12 2	8 13	147 2	21 0

Table IX.—*continued.*

Detailed Record of Food consumed, and Milk yielded, by Cows fed on the Unsewaged and Sewaged Meadow Grass, with Oilcake in addition.

Second Season, 1862 ; 7 days.—August 8 to August 14.

		Friday.	Saturday.	Sunday.	Monday.	Tuesday.	Wednesday.	Thursday.	Total in 7 days.	Per head per day.
THREE COWS.—UNSEWAGED GRASS.										
Food consumed.	From which Field, Plot, and Crop.	Ten-acre, Plot 0,* Crop 2.	†	†	†	†	†	†	—	—
Grass	Quantities weighed	tons. cwts. qrs. lbs. 0 7 1 13	tons. cwts. qrs. lbs. 0 6 0 0	tons. cwts. qrs. lbs. 0 3 0 13	tons. cwts. qrs. lbs. 0 3 0 13	tons. cwts. qrs. lbs. 0 4 0 16	tons. cwts. qrs. lbs. 0 5 1 11	tons. cwts. qrs. lbs. 0 3 3 12	tons. cwts. qrs. lbs. 1 12 3 22	tons. cwts. qrs. lbs. 0 1 2 8
Oilcake (rape-cake)		0 0 0 12	0 0 0 12	0 0 0 12	0 0 0 12	0 0 0 12	0 0 0 12	0 0 0 12	0 0 3 0	0 0 0 4

Yield of Milk, &c. — Cows Nos.	Breed.	Years old.	Dates of Calving.	Weights (July 24). lbs.	Friday A.M.	Friday P.M.	Saturday A.M.	Saturday P.M.	Sunday A.M.	Sunday P.M.	Monday A.M.	Monday P.M.	Tuesday A.M.	Tuesday P.M.	Wednesday A.M.	Wednesday P.M.	Thursday A.M.	Thursday P.M.	Total in 7 days.	Per head per day.
					lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs.	lbs. ozs.
1	Cross Sht.-horn	6	Mar. 20	1,090	14 0	10 0	13 12	9 5	15 6	10 11	15 1	10 10	14 8	10 2	14 12	9 15	14 4	10 0	172 6	24 10
2	Cross Sht.-horn	7	Dec. 25	1,127	8 6	7 2	7 11	8 5	8 6	9 0	8 0	8 5	7 9	7 0	7 10	8 6	7 6	7 9	110 11	15 13
3	Cross Sht.-horn	Aged	Feb. 26	1,011	15 2	10 2	14 11	11 1	15 5	9 3	15 10	10 13	13 0	10 12	15 4	10 2	14 9	10 15	176 9	25 4
	Totals			3,228	37 8	27 4	36 2	28 11	39 1	28 14	38 11	29 12	35 1	27 14	37 10	28 7	36 3	28 8	459 10	—
	Means			1,076	12 8	9 1	12 1	9 9	13 0	9 10	12 14	9 14	11 11	9 5	12 9	9 8	12 1	9 8	153 3	21 14

TWELVE COWS.—SEWAGED GRASS.										
Food consumed.	From which Field, Plot, and Crop.	‡	‡	‡	‡	‡	‡	‡	—	—
Grass	Quantities weighed	tons. cwts. qrs. lbs. 0 17 1 9	tons. cwts. qrs. lbs. 0 13 0 3	tons. cwts. qrs. lbs. 0 11 1 5	tons. cwts. qrs. lbs. 0 11 1 5	tons. cwts. qrs. lbs. 0 15 0 14	tons. cwts. qrs. lbs. 0 15 0 5	tons. cwts. qrs. lbs. 0 10 2 4	tons. cwts. qrs. lbs. 4 13 2 17	tons. cwts. qrs. lbs. 0 1 0 13
Oilcake (rape-cake)		0 0 1 20	0 0 1 20	0 0 1 20	0 0 1 20	0 0 1 20	0 0 1 20	0 0 1 20	0 3 0 0	0 0 0 4

Yield of Milk, &c. — Cows Nos.	Breed.	Years old.	Dates of Calving.	Weights (July 24). lbs.	Friday A.M.	Friday P.M.	Saturday A.M.	Saturday P.M.	Sunday A.M.	Sunday P.M.	Monday A.M.	Monday P.M.	Tuesday A.M.	Tuesday P.M.	Wednesday A.M.	Wednesday P.M.	Thursday A.M.	Thursday P.M.	Total in 7 days.	Per head per day.
					lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs.	lbs. ozs.
1	Cross Sht.-horn	6	Nov. 18	1,192	11 12	8 6	11 12	8 10	12 0	9 14	11 12	8 5	11 10	8 9	11 13	8 15	11 12	8 12	143 14	20 9
2	Cross Sht.-horn	8	Feb. 2	1,246	8 4	6 10	9 0	6 2	9 1	7 5	9 6	6 10	9 12	6 10	9 10	5 8	8 9	6 12	109 3	15 10
3	Cross Sht.-horn	6	Dec. 1	1,232	9 0	7 0	10 4	7 6	10 2	8 2	10 4	7 7	10 3	7 6	10 10	7 9	10 2	7 12	123 3	17 10
4	Cross Sht.-horn	Aged	Jan. 26	1,000	11 4	8 9	11 2	7 10	11 6	7 12	10 12	7 6	11 2	8 1	11 8	7 12	10 4	8 4	132 12	18 15
5	Cross Sht.-horn	6	Nov. 17	1,176	8 6	6 15	8 14	6 5	8 7	7 2	8 8	5 11	7 12	6 14	9 0	6 8	8 13	6 12	105 15	15 2
6	Cross Sht.-horn	Aged	Jan. 13	1,121	12 10	8 4	12 4	8 12	12 6	9 15	11 14	9 3	13 0	9 0	12 13	8 15	12 11	9 13	151 8	21 10
7	Cross Sht.-horn	6	May 2	1,071	18 0	13 2	18 5	13 6	18 7	14 9	18 14	13 0	18 0	12 14	18 4	12 13	18 1	14 4	221 15	31 11
8	Cross Ayrshire	3	Apr. 13	824	11 4	8 6	11 7	8 7	12 0	8 4	12 5	7 11	10 8	7 8	11 13	8 0	11 7	8 6	137 6	19 10
9	Cross Sht.-horn	Aged	Feb. 16	1,116	10 0	9 4	11 11	8 8	12 0	9. 5	12 4	7 8	12 13	9 6	13 0	8 13	12 8	9 5	146 5	20 14
10	Ayrshire	6	Apr. 3	952	17 0	11 14	17 15	11 10	17 6	12 12	17 8	10 14	17 6	11 15	18 6	11 13	18 2	12 7	207 0	29 9
11	Guernsey	4	Mar. 30	854	12 8	8 10	11 6	8 8	12 8	9 8	13 1	8 5	12 0	10 3	13 0	9 8	12 7	9 6	150 14	21 9
12	Cross Sht.-horn	7	Nov. 16	1,162	11 2	8 10	11 14	7 14	12 2	8 3	12 0	8 3	11 12	8 10	11 13	8 4	12 2	8 12	141 5	20 3
	Totals			12,946	141 2	105 10	145 14	103 2	147 13	112 11	148 8	100 3	145 14	107 0	151 10	104 6	146 14	110 9	1,771 4	—
	Means			1,079	11 12	8 13	12 2	8 10	12 5	9 6	12 6	8 6	12 3	8 15	12 10	8 11	12 4	9 3	147 10	21 1

* Unmeasured land, designated Plot 0 when unsewaged. † Clover. ‡ Not experimental.

Table IX.—*continued.*

Detailed Record of Food consumed, and Milk yielded, by Cows fed on the Unsewaged and Sewaged Meadow Grass, with Oilcake in addition.

Second Season, 1862 ; 7 days.—August 15 to August 21.

Three Cows.—Unsewaged Grass.

Food consumed		Friday.	Saturday.	Sunday.	Monday.	Tuesday.	Wednesday.	Thursday.	Total in 7 days.	Per head per day.
Grass	From which Field, Plot, and Crop.	—	*	*	*	*	*	*	—	—
	Quantities weighed	tons. cwts. grs. lbs. —	tons. cwts. grs. lbs. 0 4 2 15	tons. cwts. grs. lbs. 0 1 3 4	tons. cwts. grs. lbs. 0 1 3 4	tons. cwts. grs. lbs. 0 3 3 5	tons. cwts. grs. lbs. 0 2 0 12	tons. cwts. grs. lbs. 0 2 3 10	tons. cwts. grs. lbs. 0 16 3 22	tons. cwts. grs. lbs. 0 0 3 6
Oilcake (rape-cake)		0 0 0 12	0 0 0 12	0 0 0 12	0 0 0 12	0 0 0 12	0 0 0 12	0 0 0 12	0 0 3 0	0 0 0 4

Yield of Milk, &c.	Cows. Nos.	Breed.	Years old.	Dates of Calving.	Weights (Aug. 21). lbs.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	—	—
						lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs.	lbs.
	1	Cross Sht.-horn	6	Mar. 20	1,076	14 4	10 9	15 6	10 13	15 1	10 12	15 12	10 1	15 0	10 6	14 12	10 10	15 2	8 10	177 2	25 5
	2	Cross Sht.-horn	7	Dec. 25	1,170	7 0	8 10	8 7	7 14	6 13	8 3	7 4	8 0	8 2	8 0	7 14	8 1	7 13	7 5	109 6	15 10
	3	Cross Sht.-horn	Aged	Feb. 26	1,012	15 0	9 8	16 0	11 0	15 11	10 8	15 10	10 8	14 6	10 1	14 14	11 1	14 15	9 10	178 12	25 9
			Totals -		3,258	36 4	28 11	39 13	29 11	37 9	29 7	38 10	28 9	37 8	28 7	37 8	29 12	37 14	25 9	465 4	—
			Means -		1,086	12 1	9 9	13 4	9 14	12 9	9 13	12 14	9 8	12 8	9 8	12 8	9 15	12 10	8 8	155 1	22 2

Twelve Cows.—Sewaged Grass.

Food consumed		Friday.	Saturday.	Sunday.	Monday.	Tuesday.	Wednesday.	Thursday.	Total in 7 days.	Per head per day.
Grass	From which Field, Plot, and Crop -	†	†	†	†	†	Ten-acre, Plot 2, Crop 2.	Ten-acre, Plot 2, Crop 2.	—	—
	Quantities weighed	tons. cwts. grs. lbs. 0 17 0 27	tons. cwts. grs. lbs. 0 15 1 9	tons. cwts. grs. lbs. 0 14 1 13	tons. cwts. grs. lbs. 0 14 1 13	tons. cwts. grs. lbs. 0 18 2 11	tons. cwts. grs. lbs. 0 15 0 15	tons. cwts. grs. lbs. 0 9 1 11	tons. cwts. grs. lbs. 5 4 1 15	tons. cwts. grs. lbs. 0 1 0 27
Oilcake (rape-cake -		0 0 1 20	0 0 1 20	0 0 1 20	0 0 1 20	0 0 1 20	0 0 1 20	0 0 1 20	0 3 0 0	0 0 0 4

Yield of Milk, &c.	Cows. Nos.	Breed.	Years old.	Dates of Calving.	Weights (Aug. 21). lbs.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	—	—
						lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs.	lbs.
	1	Cross Sht.-horn	6	Nov. 18	1,224	11 12	8 0	11 10	8 6	11 10	8 11	10 2	8 0	11 10	8 5	11 8	8 2	11 0	8 10	137 6	19 10
	2	Cross Sht.-horn	8	Feb. 2	1,237	8 11	6 8	8 9	6 12	8 9	7 0	8 7	6 1	8 12	6 7	8 4	6 3	8 0	6 1	104 4	14 14
	3	Cross Sht.-horn	6	Dec. 1	1,224	10 6	7 8	10 11	7 4	10 7	8 0	9 11	7 8	10 11	7 6	10 0	7 11	9 1	7 3	123 7	17 10
	4	Cross Sht.-horn	Aged	Jan. 26	973	11 3	6 14	11 1	7 11	11 0	7 3	11 2	7 6	11 0	7 10	11 0	7 0	10 7	6 14	127 7	18 3
	5	Cross Sht.-horn	6	Nov. 17	1,158	9 9	6 4	9 7	6 10	9 6	7 7	8 12	6 4	9 1	6 6	9 4	6 7	9 2	6 9	110 8	15 13
	6	Cross Sht.-horn	Aged	Jan. 13	1,125	12 10	9 3	12 6	8 14	12 3	9 4	12 0	8 7	12 4	9 0	12 2	8 7	12 4	8 12	147 12	21 2
	7	Cross Sht.-horn	6	May 2	1,109	17 15	13 5	18 0	13 10	17 9	14 4	17 6	12 6	17 2	13 1	17 7	12 13	16 5	13 1	214 4	30 10
	8	Cross Ayrshire	3	Apr. 13	834	12 4	8 1	12 13	8 10	12 4	8 3	12 2	8 0	11 7	8 12	12 7	7 14	11 0	8 4	142 1	20 5
	9	Cross Sht.-horn	Aged	Feb. 16	1,136	12 2	9 0	13 0	9 2	10 5	10 8	12 3	8 14	11 3	10 0	12 3	8 10	11 14	9 8	148 8	21 3
	10	Ayrshire -	6	Apr. 3	950	17 9	11 7	18 9	11 10	18 0	10 15	18 1	10 10	17 3	11 0	16 10	10 13	16 0	12 3	200 10	28 11
	11	Guernsey -	4	Mar. 30	854	12 11	9 6	13 4	9 6	12 2	8 11	12 12	9 0	13 12	9 2	12 2	9 11	12 6	9 6	153 11	21 15
	12	Cross Sht.-horn	7	Nov. 16	1,155	11 12	8 10	12 0	8 4	13 0	7 15	12 1	7 5	10 12	8 6	10 13	7 10	10 8	8 0	137 0	19 9
			Totals -		12,979	148 8	104 2	151 6	106 3	146 7	108 1	144 11	99 13	144 13	105 7	143 12	101 5	137 15	104 7	1,746 14	—
			Means -		1,082	12 6	8 11	12 10	8 13	12 3	9 0	12 1	8 5	12 1	8 13	12 0	8 7	11 8	8 11	145 9	20 13

* Clover.

†Not experimental.

Table IX.—*continued.*

Detailed Record of Food consumed, and Milk yielded, by Cows fed on the Unsewaged and Sewaged Meadow Grass, with Oilcake in addition.

Second Season, 1862 ; 7 days.—August 22 to August 28.

Three Cows.—Unsewaged Grass.

		Friday.	Saturday.	Sunday.	Monday.	Tuesday.	Wednesday.	Thursday.	Total in 7 days.	Per head per day.
Food consumed.	From which Field, Plot, and Crop.	*	*	*	*	*	*	*	—	—
Grass	Quantities weighed	tons. cwts. qrs. lbs. 0 3 1 12	tons. cwts. qrs. lbs. 0 4 3 0	tons. cwts. qrs. lbs. 0 2 2 27	tons. cwts. qrs. lbs. 0 2 2 26	tons. cwts. qrs. lbs. 0 3 2 24	tons. cwts. qrs. lbs. 0 3 2 0	tons. cwts. qrs. lbs. 0 1 3 1	tons. cwts. qrs. lbs. 1 2 2 6	tons. cwts. qrs. lbs. 0 1 0 8
Oilcake (equal parts linseed and rape cake)		0 0 0 12	0 0 0 12	0 0 0 12	0 0 0 12	0 0 0 12	0 0 0 12	0 0 0 12	0 0 3 0	0 0 0 4

Yield of Milk, &c.	Cows. Nos.	Breed.	Years old.	Dates of Calving.	Weights (Aug. 21). lbs.	Friday. A.M.	Friday. P.M.	Saturday. A.M.	Saturday. P.M.	Sunday. A.M.	Sunday. P.M.	Monday. A.M.	Monday. P.M.	Tuesday. A.M.	Tuesday. P.M.	Wednesday. A.M.	Wednesday. P.M.	Thursday. A.M.	Thursday. P.M.	Total in 7 days. —	Per head per day. —
						lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.
	1	Cross Sht.-horn	6	Mar. 20	1,076	15 3	12 0	16 2	11 13	15 8	10 9	15 8	10 12	15 0	12 0	14 5	9 12	14 6	11 12	185 10	26 8
	2	Cross Sht.-horn	7	Dec. 25	1,170	9 6	7 0	7 8	7 6	7 8	7 6	6 12	6 12	7 15	6 5	6 12	6 6	6 0	8 0	101 0	14 7
	3	Cross Sht.-horn	Aged	Feb. 26	1,012	15 10	10 8	16 4	10 11	16 3	10 4	16 2	10 4	15 4	11 1	15 4	10 9	15 4	11 3	184 7	26 6
			Totals -		3,258	40 3	29 8	39 14	29 14	40 3	28 3	38 6	27 12	38 3	29 6	36 5	26 11	35 10	30 15	471 1	—
			Means -		1,086	13 6	9 13	13 5	9 15	13 6	9 6	12 13	9 4	12 12	9 13	12 2	8 14	11 14	10 5	157 0	22 7

Twelve Cows.—Sewaged Grass.

		Friday.	Saturday.	Sunday.	Monday.	Tuesday.	Wednesday.	Thursday.	Total in 7 days.	Per head per day.
Food consumed.	From which Field, Plot, and Crop.	Ten-acre, Plot 2, Crop 2.	Ten-acre, Plot 2, Crop 2.	Ten-acre, Plot 2, Crop 2.	Ten-acre, Plot 2, Crop 2.	Ten-acre, Plot 2, Crop 2.	Ten-acre, Plot 2, Crop 2.	Ten-acre, Plots out and 2, Crop 2, and Plot 4, Crop 3.	—	—
Grass	Quantities weighed	tons. cwts. qrs. lbs. 0 15 0 11	tons. cwts. qrs. lbs. 0 17 0 19	tons. cwts. qrs. lbs. 0 18 0 17	tons. cwts. qrs. lbs. 0 18 0 22	tons. cwts. qrs. lbs. 0 12 2 25	tons. cwts. qrs. lbs. 0 17 0 1	tons. cwts. qrs. lbs. 0 16 0 24	tons. cwts. qrs. lbs. 5 14 2 7	tons. cwts. qrs. lbs. 0 1 1 13
Oilcake (equal parts linseed and rape cake)		0 0 1 20	0 0 1 20	0 0 1 20	0 0 1 20	0 0 1 20	0 0 1 20	0 0 1 20	0 3 0 0	0 0 0 4

Yield of Milk, &c.	Cows. Nos.	Breed.	Years old.	Dates of Calving.	Weights (Aug. 21). lbs.	Friday. A.M.	Friday. P.M.	Saturday. A.M.	Saturday. P.M.	Sunday. A.M.	Sunday. P.M.	Monday. A.M.	Monday. P.M.	Tuesday. A.M.	Tuesday. P.M.	Wednesday. A.M.	Wednesday. P.M.	Thursday. A.M.	Thursday. P.M.	Total in 7 days. —	Per head per day. —
						lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.
	1	Cross Sht.-horn	6	Nov. 18	1,224	11 4	8 0	11 0	7 12	11 10	8 2	11 0	8 1	11 2	8 9	11 12	8 4	11 6	8 12	136 10	19 8
	2	Cross Sht.-horn	8	Feb. 2	1,237	8 0	6 1	8 1	6 2	8 10	6 3	7 10	6 0	7 3	6 3	9 0	6 3	8 0	6 13	100 1	14 5
	3	Cross Sht.-horn	6	Dec. 1	1,224	9 8	7 8	10 4	7 9	10 4	7 5	9 0	7 1	9 5	6 5	10 8	7 0	9 12	7 8	118 13	17 0
	4	Cross Sht.-horn	Aged	Jan. 26	973	10 6	7 2	10 0	6 15	10 11	7 5	8 10	7 0	9 8	7 14	11 0	7 0	7 6	7 11	118 8	16 15
	5	Cross Sht.-horn	6	Nov. 17	1,158	8 8	6 1	8 12	6 3	8 9	6 6	8 11	5 10	7 11	7 0	8 11	6 1	8 0	6 9	102 12	14 11
	6	Cross Sht.-horn	Aged	Jan. 13	1,125	13 0	8 13	12 2	9 9	12 7	8 10	12 12	7 12	11 8	9 2	12 8	9 1	12 8	9 4	149 0	21 5
	7	Cross Sht.-horn	6	May 2	1,109	17 2	13 1	18 2	12 2	17 13	12 6	17 5	11 8	15 10	11 0	17 5	10 1	16 13	12 4	202 8	28 15
	8	Cross Ayrshire	3	Apr. 13	834	11 13	7 12	12 6	8 3	12 10	8 8	12 6	7 10	10 12	9 7	12 5	8 1	11 11	8 2	141 10	20 4
	9	Cross Sht.-horn	Aged	Feb. 16	1,136	11 6	9 6	12 0	8 13	11 4	8 3	11 6	7 10	10 8	9 14	12 6	8 8	11 12	8 4	141 4	20 3
	10	Ayrshire -	6	Apr. 3	950	17 3	11 6	17 7	12 1	16 10	10 12	15 14	10 4	14 0	12 6	17 6	10 14	16 9	11 10	194 6	27 12
	11	Guernsey -	4	Mar. 30	854	12 10	9 4	12 14	8 7	13 2	8 12	12 5	8 8	11 1	10 6	12 3	9 3	12 13	9 0	150 8	21 8
	12	Cross Sht.-horn	7	Nov. 16	1,155	11 0	7 2	11 8	6 6	10 1	7 8	10 14	7 6	11 6	7 14	10 1	6 15	11 12	7 14	127 11	18 4
			Totals -		12,979	141 12	101 8	144 8	100 2	143 11	100 0	137 13	94 6	129 10	106 0	145 1	97 3	138 6	103 11	1,683 11	—
			Means -		1,082	11 13	8 7	12 1	8 5	12 0	8 5	11 8	7 14	10 13	8 13	12 1	8 2	11 9	8 10	140 5	20 1

* Clover.

† Unmeasured land, designated Plot 00 when sewaged.

Table IX.—*continued.*

Detailed Record of Food consumed, and Milk yielded, by Cows fed on the Unsewaged and Sewaged Meadow Grass, with Oilcake in addition. Second Season, 1862; 7 days.—August 29 to September 4.

Three Cows.—Unsewaged Grass.

		Friday.	Saturday.	Sunday.	Monday.	Tuesday.	Wednesday.	Thursday.	Total in 7 days.	Per head per day.
Food consumed.	From which Field, Plot, and Crop.	Ten-acre, Plot 1, Crop 2.	Ten-acre, Plot 1, Crop 2.	Ten-acre, Plot 1, Crop 2.	Ten-acre, Plot 1, Crop 2.	Ten-acre, Plot 1, Crop 2.	Ten-acre, Plot 1, Crop 2.	Ten-acre, Plot 1, Crop 2.	—	—
Grass	Quantities weighed	tons. cwts. qrs. lbs. 0 2 2 3½	tons. cwts. qrs. lbs. 0 2 1 25½	tons. cwts. qrs. lbs. 0 1 2 22½	tons. cwts. qrs. lbs. 0 1 2 24	tons. cwts. qrs. lbs. 0 2 2 11½	tons. cwts. qrs. lbs. 0 3 3 11½	tons. cwts. qrs. lbs. 0 3 3 1½	tons. cwts. qrs. lbs. 0 18 2 16	tons. cwts. qrs. lbs. 0 0 3 15
Oilcake (equal parts linseed and rape cake)		0 0 0 12	0 0 0 12	0 0 0 12	0 0 0 12	0 0 0 12	0 0 0 12	0 0 0 12	0 0 3 0	0 0 0 4

Yield of Milk, &c. — Cows. Nos.	Breed.	Years old.	Dates of Calving.	Weights (Aug. 21). lbs.	Friday A.M. lbs. ozs.	Friday P.M. lbs. ozs.	Saturday A.M. lbs. ozs.	Saturday P.M. lbs. ozs.	Sunday A.M. lbs. ozs.	Sunday P.M. lbs. ozs.	Monday A.M. lbs. ozs.	Monday P.M. lbs. ozs.	Tuesday A.M. lbs. ozs.	Tuesday P.M. lbs. ozs.	Wednesday A.M. lbs. ozs.	Wednesday P.M. lbs. ozs.	Thursday A.M. lbs. ozs.	Thursday P.M. lbs. ozs.	— lbs. ozs.	— lbs. ozs.
1	Cross Sht.-horn	6	Mar. 20	1,076	15 0	11 12	16 0	10 8	15 12	10 1	14 6	9 6	14 4	11 1	13 10	9 14	14 6	10 12	176 12	25 4
2	Cross Sht.-horn	7	Dec. 25	1,170	7 8	5 9	7 14	7 8	6 1	6 10	6 0	7 10	5 10	6 15	6 0	7 10	6 8	6 8	93 15	13 7
3	Cross Sht.-horn	Aged	Feb. 26	1,012	17 0	10 6	16 2	12 0	16 3	10 10	16 3	10 2	16 6	10 4	17 2	11 1	16 0	11 4	190 11	27 4
			Totals -	3,258	39 8	27 11	40 0	30 0	38 0	27 5	36 9	27 2	36 4	28 4	36 12	28 9	36 14	28 8	461 6	—
			Means -	1,086	13 3	9 4	13 5	10 0	12 11	9 2	12 3	9 1	12 1	9 6	12 4	9 8	12 5	9 8	153 13	22 0

Twelve Cows.—Sewaged Grass.

		Friday.	Saturday.	Sunday.	Monday.	Tuesday.	Wednesday.	Thursday.	Total in 7 days.	Per head per day.
Food consumed.	From which Field, Plot, and Crop.	Ten-acre, Plot 4, Crop 3.	Ten-acre, Plot 4, Crop 3.	Ten-acre, Plot 4, Crop 3.	Ten-acre, Plot 4, Crop 3.	Ten-acre, Plot 4, Crop 3.	Ten-acre, Plot 4, Crop 3.	Ten-acre, Plot 4, Crop 3.	—	—
Grass	Quantities weighed	tons. cwts. qrs. lbs. 0 18 0 9	tons. cwts. qrs. lbs. 0 14 2 5	tons. cwts. qrs. lbs. 0 5 0 23	tons. cwts. qrs. lbs. 0 5 1 1	tons. cwts. qrs. lbs. 0 13 2 14	tons. cwts. qrs. lbs. 0 15 2 12	tons. cwts. qrs. lbs. 0 13 1 25	tons. cwts. qrs. lbs. 4 5 3 5	tons. cwts. qrs. lbs. 0 1 0 2
Oilcake (equal parts linseed and rape cake)		0 0 1 20	0 0 1 20	0 0 1 20	0 0 1 20	0 0 1 20	0 0 1 20	0 0 1 20	0 3 0 0	0 0 0 4

Yield of Milk, &c. — Cows. Nos.	Breed.	Years old.	Dates of Calving.	Weights (Aug. 21). lbs.	Friday A.M. lbs. ozs.	Friday P.M. lbs. ozs.	Saturday A.M. lbs. ozs.	Saturday P.M. lbs. ozs.	Sunday A.M. lbs. ozs.	Sunday P.M. lbs. ozs.	Monday A.M. lbs. ozs.	Monday P.M. lbs. ozs.	Tuesday A.M. lbs. ozs.	Tuesday P.M. lbs. ozs.	Wednesday A.M. lbs. ozs.	Wednesday P.M. lbs. ozs.	Thursday A.M. lbs. ozs.	Thursday P.M. lbs. ozs.	— lbs. ozs.	— lbs. ozs.
1	Cross Sht.-horn	6	Nov. 18	1,224	11 13	8 7	11 10	8 0	11 11	8 7	11 3	7 12	11 4	8 7	11 13	8 2	11 12	8 10	138 15	19 14
2	Cross Sht.-horn	8	Feb. 2	1,237	8 6	5 8	8 3	5 14	8 4	5 13	7 12	5 14	8 2	6 2	8 12	5 13	8 7	6 2	99 0	14 2
3	Cross Sht.-horn	6	Dec. 1	1,224	10 3	7 0	10 0	6 9	8 0	8 3	8 4	6 4	8 14	7 0	9 8	6 3	9 6	6 10	112 0	16 0
4	Cross Sht.-horn	Aged	Jan. 26	973	10 8	7 0	10 5	6 13	10 0	6 10	9 6	6 8	9 1	6 14	9 6	6 9	9 0	7 5	115 5	16 8
5	Cross Sht.-horn	6	Nov. 17	1,158	9 0	5 10	8 14	6 12	8 0	6 4	7 9	5 2	7 4	5 10	7 10	5 12	7 11	6 1	97 3	13 14
6	Cross Sht.-horn	Aged	Jan. 13	1,125	12 13	8 15	12 11	8 4	12 10	8 6	12 13	7 10	12 0	8 6	12 9	7 15	12 2	8 10	145 12	20 13
7	Cross Sht.-horn	6	May 2	1,109	17 2	12 2	17 14	11 12	17 6	12 15	16 8	10 12	17 3	12 8	17 4	12 2	16 7	11 15	203 14	29 2
8	Cross Ayrshire	3	Apr. 13	834	11 7	7 9	12 10	7 13	11 14	8 8	11 11	7 0	11 5	8 8	12 4	7 4	11 6	8 0	137 3	19 10
9	Cross Sht.-horn	Aged	Feb. 16	1,136	12 11	8 4	12 1	8 4	12 6	9 0	11 4	7 8	12 12	9 5	13 1	8 7	12 5	8 8	145 12	20 13
10	Ayrshire	6	Apr. 3	950	17 2	11 2	16 1	10 10	15 7	11 9	15 0	8 10	14 6	10 14	16 7	10 1	14 10	10 6	182 5	26 1
11	Guernsey	4	Mar. 30	854	12 6	9 0	13 0	7 11	12 5	8 15	12 2	6 14	11 5	9 6	12 5	8 1	12 3	7 5	142 14	20 7
12	Cross Sht.-horn	7	Nov. 16	1,155	10 1	7 5	9 6	6 10	9 4	6 14	11 1	5 15	10 1	7 3	8 4	6 1	9 8	6 11	114 4	16 5
			Totals -	12,979	143 8	97 14	142 11	95 0	137 3	101 8	134 9	85 13	133 9	100 3	139 3	92 6	134 13	96 3	1,634 7	—
			Means -	1,082	11 15	8 3	11 14	7 15	11 7	8 7	11 3	7 2	11 2	8 6	11 10	7 11	11 4	8 0	136 3	19 7

Table IX.—*continued.*

Detailed Record of Food consumed, and Milk yielded, by Cows fed on the Unsewaged and Sewaged Meadow Grass, with Oilcake in addition.

Second Season, 1862 ; 7 days.—September 5 to September 11.

Three Cows.—Unsewaged Grass.

Food consumed		Friday.	Saturday.	Sunday.	Monday.	Tuesday.	Wednesday.	Thursday.	Total in 7 days.	Per head per day.
Grass	From which Field, Plot, and Crop.	Ten-acre, Plot 1, Crop 2.	Ten-acre, Plot 1, Crop 2.	Ten-acre, Plot 1, Crop 2.	Ten-acre, Plot 1, Crop 2.	Ten-acre, Plot 1, Crop 2.	Ten-acre, Plot 1, Crop 2.	Ten-acre, Plot 1, Crop 2.	—	—
	Quantities weighed	*tons.* *cwts.* *grs.* *lbs.* 0 3 2 11¼	*tons.* *cwts.* *grs.* *lbs.* 0 3 1 22¼	*tons.* *cwts.* *grs.* *lbs.* 0 4 0 14½	*tons.* *cwts.* *grs.* *lbs.* 0 4 0 17	*tons.* *cwts.* *grs.* *lbs.* 0 3 3 24½	*tons.* *cwts.* *grs.* *lbs.* 0 3 0 24½	*tons.* *cwts.* *grs.* *lbs.* 0 3 3 4½	*tons.* *cwts.* *grs.* *lbs.* 1 6 1 7	*tons.* *cwts.* *grs.* *lbs.* 0 1 1 0
Oilcake (equal parts linseed and rape cake)		0 0 0 12	0 0 0 12	0 0 0 12	0 0 0 12	0 0 0 12	0 0 0 12	0 0 0 12	0 0 3 0	0 0 0 4

Yield of Milk, &c.	Cows. Nos.	Breed.	Years old.	Dates of Calving.	Weights (Aug. 21). *lbs.*	Friday. A.M.	Friday. P.M.	Saturday. A.M.	Saturday. P.M.	Sunday. A.M.	Sunday. P.M.	Monday. A.M.	Monday. P.M.	Tuesday. A.M.	Tuesday. P.M.	Wednesday. A.M.	Wednesday. P.M.	Thursday. A.M.	Thursday. P.M.	—	—
						lbs. *ozs.*	*lbs.* *ozs.*	*lbs.* *ozs.*	*lbs.* *ozs.*	*lbs.* *ozs.*	*lbs.* *ozs.*	*lbs.* *ozs.*	*lbs.* *ozs.*	*lbs.* *ozs.*	*lbs.* *ozs.*	*lbs.* *ozs.*	*lbs.* *ozs.*	*lbs.* *ozs.*	*lbs.* *ozs.*	*lbs.* *ozs.*	*lbs.* *ozs.*
	1	Cross Sht.-horn	6	Mar. 20	1,076	15 2	9 3	14 14	9 3	14 4	10 3	15 3	10 6	15 0	10 15	16 0	11 0	14 6	10 7	176	12
	2	Cross Sht.-horn	7	Dec. 25	1,170	7 8	6 9	7 14	5 7	4 10	9 2	5 5	6 12	6 12	7 15	7 1	5 13	6 8	6 14	94	2
	3	Cross Sht.-horn	Aged	Feb. 26	1,012	16 11	10 12	16 7	10 8	16 1	10 10	16 8	11 2	17 0	10 15	16 4	11 9	16 2	10 10	191	3
		Totals -			3,258	39 5	26 13	39 3	25 7	34 15	29 15	37 0	28 4	38 12	29 13	39 5	28 6	37 0	27 15	462	1
		Means -			1,086	13 2	8 15	13 1	8 8	11 10	10 0	12 5	9 6	12 15	9 15	13 2	9 7	12 5	9 5	154	0

																					22 0

Twelve Cows.—Sewaged Grass.

Food consumed		Friday.	Saturday.	Sunday.	Monday.	Tuesday.	Wednesday.	Thursday.	Total in 7 days.	Per head per day.
Grass	From which Field, Plot, and Crop.	Ten-acre, Plot 4, Crop 3.	Ten-acre, Plot 4, Crop 3.	Ten-acre, Plots 3 and 4, Crop 3.	Ten-acre, Plots 3 and 4, Crop 3.	Ten-acre, Plot 3, Crop 3.	Ten-acre, Plot 3, Crop 3.	Ten-acre, Plot 3, Crop 3.	—	—
	Quantities weighed	*tons.* *cwts.* *grs.* *lbs.* 0 18 0 11	*tons.* *cwts.* *grs.* *lbs.* 1 8 2 14	*tons.* *cwts.* *grs.* *lbs.* 0 15 3 15	*tons.* *cwts.* *grs.* *lbs.* 0 15 3 21	*tons.* *cwts.* *grs.* *lbs.* 0 5 1 24	*tons.* *cwts.* *grs.* *lbs.* 0 16 1 4	*tons.* *cwts.* *grs.* *lbs.* 0 17 0 26	*tons.* *cwts.* *grs.* *lbs.* 5 17 2 3	*tons.* *cwts.* *grs.* *lbs.* 0 1 1 17
Oilcake (equal parts linseed and rape cake)		0 0 1 20	0 0 1 20	0 0 1 20	0 0 1 20	0 0 1 20	0 0 1 20	0 0 1 20	0 3 0 0	0 0 0 4

Yield of Milk, &c.	Cows. Nos.	Breed.	Years old.	Dates of Calving.	Weights (Aug. 21). *lbs.*	Friday. A.M.	Friday. P.M.	Saturday. A.M.	Saturday. P.M.	Sunday. A.M.	Sunday. P.M.	Monday. A.M.	Monday. P.M.	Tuesday. A.M.	Tuesday. P.M.	Wednesday. A.M.	Wednesday. P.M.	Thursday. A.M.	Thursday. P.M.	—	—
						lbs. *ozs.*	*lbs.* *ozs.*	*lbs.* *ozs.*	*lbs.* *ozs.*	*lbs.* *ozs.*	*lbs.* *ozs.*	*lbs.* *ozs.*	*lbs.* *ozs.*	*lbs.* *ozs.*	*lbs.* *ozs.*	*lbs.* *ozs.*	*lbs.* *ozs.*	*lbs.* *ozs.*	*lbs.* *ozs.*	*lbs.* *ozs.*	*lbs.* *ozs.*
	1	Cross Sht.-horn	6	Nov. 18	1,224	11 8	8 8	11 12	8 13	11 14	8 12	11 9	7 8	11 1	7 14	11 12	7 5	11 9	8 0	137	13
	2	Cross Sht.-horn	8	Feb. 2	1,237	8 2	6 11	8 6	5 14	7 6	5 9	7 6	5 6	7 0	5 7	8 1	5 0	7 12	5 6	93	6
	3	Cross Sht.-horn	6	Dec. 1	1,224	9 3	6 12	8 12	6 12	9 1	6 8	8 14	6 0	7 12	6 12	9 2	5 10	8 11	5 15	105	12
	4	Cross Sht.-horn	Aged	Jan. 26	973	9 7	6 4	9 10	7 1	9 4	6 11	8 9	7 0	8 9	6 4	9 13	6 2	8 15	6 3	109	12
	5	Cross Sht.-horn	6	Nov. 17	1,158	7 8	5 7	7 7	5 15	7 2	5 8	7 10	5 1	7 2	5 8	6 8	6 1	7 0	5 3	89	0
	6	Cross Sht.-horn	Aged	Jan. 13	1,125	12 3	8 11	12 3	8 8	12 1	9 0	11 1	7 13	11 10	8 5	12 0	7 13	11 4	8 3	140	11
	7	Cross Sht.-horn	6	May 2	1,109	16 3	12 10	15 14	12 7	17 4	11 8	14 11	11 0	14 0	11 11	16 2	12 0	15 7	11 1	191	14
	8	Cross Ayrshire	3	Apr. 13	834	13 1	8 13	13 0	8 3	12 14	7 10	11 6	7 2	11 0	8 2	13 1	7 13	12 0	7 11	141	12
	9	Cross Sht.-horn	Aged	Feb. 16	1,136	12 4	8 12	11 8	8 11	10 2	8 11	9 12	8 10	10 12	8 1	11 1	7 8	10 12	8 1	134	9
	10	Ayrshire -	6	Apr. 3	950	15 14	10 11	15 8	9 10	16 11	9 1	14 4	9 8	15 4	10 12	15 14	10 3	14 2	10 6	177	12
	11	Guernsey -	4	Mar. 30	854	12 0	7 14	12 12	9 7	12 0	6 14	11 0	8 0	11 1	8 8	12 8	7 9	8 11	9 11	137	15
	12	Cross Sht.-horn	7	Nov. 16	1,155	9 6	6 12	10 4	6 13	10 8	7 5	10 6	8 2	11 9	7 11	12 6	8 8	11 6	8 14	129	14
		Totals -			12,979	136 11	97 13	137 0	98 2	136 3	93 1	126 8	91 2	126 12	94 15	138 4	91 8	127 9	94 10	1,590	2
		Means -			1,082	11 6	8 2	11 7	8 3	11 6	7 12	10 9	7 9	10 9	7 15	11 8	7 10	10 10	7 14	132	8

																					18 15

Table IX.—*continued.*

Detailed Record of Food consumed, and Milk yielded, by Cows fed on the Unsewaged and Sewaged Meadow Grass, with Oilcake in addition.

Second Season, 1862; 7 days.—September 12 to September 18.

THREE COWS.—UNSEWAGED GRASS.

Food consumed.		Friday.	Saturday.	Sunday.	Monday.	Tuesday.	Wednesday.	Thursday.	Total in 7 days.	Per head per day.
Grass	From which Field, Plot, and Crop.	Ten-acre, Plot 1, Crop 2.	Ten-acre, Plot 1, Crop 2.	Ten-acre, Plot 1, Crop 2.	Ten-acre, Plot 1, Crop 2.	*	*	*	—	—
	Quantities weighed	0 4 1 17½	0 3 1 4½	0 3 1 7½	0 3 1 10	0 4 1 6	0 3 3 3	0 3 3 6	1 6 0 26½	0 1 1 0
Oilcake (equal parts linseed and rape cake)		0 0 0 12	0 0 0 12	0 0 0 12	0 0 0 12	0 0 0 12	0 0 0 12	0 0 0 12	0 0 3 0	0 0 0 4

Yield of Milk, &c.	Cows. Nos.	Breed.	Years old.	Dates of Calving.	Weights (Sept. 18). lbs.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	—	—
						lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs.	lbs.
	1	Cross Sht.-horn	6	Mar. 20	1,066	14 15	11 6	14 15	11 10	11 10	9 14	15 0	10 6	12 4	10 0	13 9	11 4	13 4	9 8	169	9
	2	Cross Sht.-horn	7	Dec. 25	1,190	6 0	7 6	6 1	8 8	6 4	6 11	7 1	7 9	5 0	6 6	6 0	5 9	5 15	5 10	90	0
	3	Cross Sht.-horn	Aged	Feb. 26	1,020	16 12	11 8	16 4	11 5	16 4	9 10	14 10	11 3	12 10	9 12	15 0	11 3	14 10	10 2	180	13
				Totals -	3,276	37 11	30 4	37 4	31 7	34 2	26 3	36 11	29 2	29 14	26 2	34 9	28 0	33 13	25 4	440	6
				Means -	1,092	12 9	10 1	12 7	10 8	11 6	8 12	12 4	9 11	9 15	8 11	11 9	9 5	11 4	8 7	146	13	21	0

TWELVE COWS.—SEWAGED GRASS.

Food consumed.		Friday.	Saturday.	Sunday.	Monday.	Tuesday.	Wednesday.	Thursday.	Total in 7 days.	Per head per day.
Grass	From which Field, Plot, and Crop.	Ten-acre, Plot 3, Crop 3.	Ten-acre, Plot 3, Crop 3.	Ten-acre, Plot 3, Crop 3.	Ten-acre, Plot 3, Crop 3.	Ten-acre, Plot 3, Crop 3.	Ten-acre, Plot 3, Crop 3.	Ten-acre, Plot 3, Crop 3.	—	—
	Quantities weighed	0 15 2 10	0 15 2 15	0 16 3 8	0 15 3 8	1 0 3 26	0 17 1 15	1 0 2 23	6 2 3 21	0 1 1 24
Oilcake (equal parts linseed and rape cake)		0 0 1 20	0 0 1 20	0 0 1 20	0 0 1 20	0 0 1 20	0 0 1 20	0 0 1 20	0 3 0 0	0 0 0 4

Yield of Milk, &c.	Cows. Nos.	Breed.	Years old.	Dates of Calving.	Weights (Sept. 18.) lbs.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	—	—
						lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.
	1	Cross Sht.-horn	6	Nov. 18	1,270	11 6	8 3	10 14	7 14	13 4	8 11	11 8	7 8	11 4	8 4	11 0	7 12	10 12	7 14	136	2
	2	Cross Sht.-horn	8	Feb. 2	1,267	7 8	5 0	7 6	5 3	8 14	6 11	7 8	5 1	7 6	5 10	7 9	5 8	7 4	5 6	91	14
	3	Cross Sht.-horn	6	Dec. 1	1,288	8 14	6 1	8 2	6 9	9 6	7 5	7 10	6 0	7 8	6 7	8 2	6 0	8 0	6 9	102	9
	4	Cross Sht.-horn	Aged	Jan. 26	975	9 8	6 6	8 14	6 12	11 12	7 6	9 4	6 3	8 0	5 10	8 11	6 3	8 6	5 1	108	0
	5	Cross Sht.-horn	6	Nov. 17	1,199	7 6	5 4	6 8	6 6	8 14	6 8	7 6	5 0	7 0	5 1	6 13	5 0	6 10	4 13	88	9
	6	Cross Sht.-horn	Aged	Jan. 13	1,150	11 6	7 12	11 4	8 10	13 0	8 10	11 2	7 12	10 8	8 10	11 2	7 13	10 10	7 8	135	11
	7	Cross Sht.-horn	6	May 2	1,106	14 6	11 11	15 0	17 8	17 12	10 7	13 1	12 8	13 10	11 3	15 9	11 6	15 0	11 0	190	1
	8	Cross Ayrshire	3	Apr. 13	850	11 12	8 4	11 13	8 1	13 12	7 7	13 0	7 9	10 0	8 1	11 7	7 5	10 4	7 3	135	14
	9	Cross Sht.-horn	Aged	Feb. 16	1,232	10 6	7 4	9 12	8 4	11 4	8 14	10 10	7 13	9 0	7 14	10 3	8 4	10 14	7 4	127	10
	10	Ayrshire -	6	Apr. 3	960	15 8	10 8	14 13	10 2	17 8	9 13	14 8	10 2	14 2	10 6	14 6	10 0	14 5	10 2	176	3
	11	Guernsey -	4	Mar. 30	834	10 9	8 7	11 14	8 9	13 8	7 3	10 14	8 2	9 12	8 2	10 4	8 11	9 10	7 10	133	3
	12	Cross Sht.-horn	7	Nov. 16	1,146	12 8	9 1	13 6	7 1	14 12	8 1	12 14	8 6	9 10	7 14	11 8	8 0	11 12	7 9	142	6
				Totals -	13,275	131 1	93 13	129 10	100 15	153 10	97 0	129 5	92 0	117 12	93 2	126 10	91 14	123 7	87 15	1,568	2
				Means -	1,106	10 15	7 13	10 13	8 7	12 13	8 1	10 12	7 11	9 13	7 12	10 9	7 10	10 5	7 5	130	11	18	11

Table IX.—*continued.*

Detailed Record of Food consumed, and Milk yielded, by Cows fed on the Unsewaged and Sewaged Meadow Grass, with Oilcake in addition.

Second Season, 1862; 7 days.—September 19 to September 25.

Three Cows.—Unsewaged Grass.

Food consumed.	From which Field, Plot, and Crop.	Friday.	Saturday.	Sunday.	Monday.	Tuesday.	Wednesday.	Thursday.	Total in 7 days.	Per head per day.
		*	Ten-acre, Plot 0,† Crop 2.	Ten-acre, Plot 0,† Crop 2.	Ten-acre, Plot 0,† Crop 2.	—	*	Ten-acre, Plot 0,† Crop 2.	—	—
Grass	Quantities weighed	0 5 1 24	0 3 1 7	0 3 3 10	0 3 3 11	—	0 3 0 17	0 5 1 4	1 4 3 17	0 1 0 21
Oilcake (equal parts linseed and rape cake)		0 0 0 12	0 0 0 12	0 0 0 12	0 0 0 12	0 0 0 12	0 0 0 12	0 0 0 12	0 0 3 0	0 0 0 4

Yield of Milk, &c.	Cows. Nos.	Breed.	Years old.	Dates of Calving.	Weights (Sept. 18). lbs.	Friday A.M.	Friday P.M.	Saturday A.M.	Saturday P.M.	Sunday A.M.	Sunday P.M.	Monday A.M.	Monday P.M.	Tuesday A.M.	Tuesday P.M.	Wednesday A.M.	Wednesday P.M.	Thursday A.M.	Thursday P.M.	—	—
						lbs. qts.	lbs. qts.	lbs. qts.	lbs. qts.	lbs. qts.	lbs. qts.	lbs. qts.	lbs. qts.	lbs. qts.	lbs. qts.	lbs. qts.	lbs. qts.	lbs. qts.	lbs. qts.	lbs. qts.	lbs. qts.
	1	Cross Sht.-horn	6	Mar. 20	1,036	13 8	10 0	13 14	10 4	15 14	10 11	14 1	8 1	13 3	9 6	13 12	10 14	15 0	10 1	168 9	24 1
	2	Cross Sht.-horn	7	Dec. 25	1,190	6 4	4 1	6 2	6 1	5 8	5 10	5 6	5 12	5 0	5 7	5 10	6 15	6 0	5 1	78 13	11 4
	3	Cross Sht.-horn	Aged	Feb. 26	1,020	14 6	10 0	14 12	10 0	15 0	12 0	12 2	10 8	12 1	9 7	16 10	10 1	15 4	10 3	172 6	24 10
		Totals	-		3,276	34 2	24 1	34 12	26 5	36 6	28 5	31 9	24 5	30 4	24 4	36 0	27 14	36 4	25 5	419 12	—
		Means	-		1,092	11 6	8 0	11 9	8 13	12 2	9 7	10 9	8 2	10 1	8 1	12 0	9 5	12 1	8 7	139 15	20 0

Twelve Cows.—Sewaged Grass.

Food consumed.	From which Field, Plot, and Crop.	Ten-acre, Plot 3. Crop 3.	Ten-acre, Plots 0† and 3, Crop 3.	*	*	Five-acre, Plot 3, Crop 3.	Five-acre, Plot 3, Crop 3.	Five-acre, Plot 3, Crop 3.	—	—
Grass	Quantities weighed	0 15 1 7	0 19 2 16	0 8 3 8	0 8 3 8	0 15 1 9	0 17 0 14	0 16 2 20	5 1 2 26	0 1 0 24
Oilcake (equal parts linseed and rape cake)		0 0 1 20	0 0 1 20	0 0 1 20	0 0 1 20	0 0 1 20	0 0 1 20	0 0 1 20	0 3 0 0	0 0 0 4

Yield of Milk, &c.	Cows. Nos.	Breed.	Years old.	Dates of Calving.	Weights (Sept. 18). lbs.	Ten-acre, Plot 3. Crop 3. A.M.	Ten-acre, Plot 3. Crop 3. P.M.	Ten-acre, Plots 0† and 3, Crop 3. A.M.	Ten-acre, Plots 0† and 3, Crop 3. P.M.	* A.M.	* P.M.	* A.M.	* P.M.	Five-acre, Plot 3, Crop 3. A.M.	Five-acre, Plot 3, Crop 3. P.M.	Five-acre, Plot 3, Crop 3. A.M.	Five-acre, Plot 3, Crop 3. P.M.	Five-acre, Plot 3, Crop 3. A.M.	Five-acre, Plot 3, Crop 3. P.M.	—	—
						lbs. qts.	lbs. qts.	lbs. qts.	lbs. qts.	lbs. qts.	lbs. qts.	lbs. qts.	lbs. qts.	lbs. qts.	lbs. qts.	lbs. qts.	lbs. qts.	lbs. qts.	lbs. qts.	lbs. qts.	lbs. qts.
	1	Cross Sht.-horn	6	Nov. 18	1,270	11 1	8 2	10 8	7 7	10 0	8 7	10 14	7 3	10 11	7 13	10 14	8 2	10 5	7 10	129 1	18 7
	2	Cross Sht.-horn	8	Feb. 2	1,267	6 7	5 6	7 2	5 1	6 8	6 4	7 4	5 8	7 6	5 1	7 6	5 4	7 0	5 8	87 1	12 7
	3	Cross Sht.-horn	6	Dec. 1	1,288	7 13	5 7	7 7	5 2	7 3	5 11	7 10	5 3	7 1	5 10	7 9	5 12	6 8	5 6	89 6	12 12
	4	Cross Sht.-horn	Aged	Jan. 26	973	8 7	6 2	8 4	5 9	8 1	5 0	9 8	5 8	8 11	5 8	8 0	5 8	8 0	5 11	97 13	14 0
	5	Cross Sht.-horn	6	Nov. 17	1,199	7 4	5 0	6 0	4 10	6 2	5 4	6 7	5 0	6 3	4 14	6 6	5 2	6 11	5 3	80 2	11 7
	6	Cross Sht.-horn	Aged	Jan. 13	1,150	11 12	7 8	11 6	7 0	10 12	8 8	10 9	7 3	10 12	7 12	13 6	8 0	11 7	9 0	134 15	19 4
	7	Cross Sht.-horn	6	May 2	1,106	14 4	11 7	14 15	10 9	15 2	10 15	14 10	9 5	14 4	11 6	16 1	10 3	15 4	11 0	179 5	25 10
	8	Cross Ayrshire	3	Apr. 18	856	10 4	7 7	10 8	7 3	11 1	7 7	11 10	6 4	10 1	7 10	11 11	7 8	11 2	7 6	127 2	18 3
	9	Cross Sht.-horn	Aged	Feb. 16	1,232	8 8	9 0	9 6	7 1	9 1	8 1	10 4	8 13	10 8	7 6	10 8	7 9	11 10	6 7	124 2	17 12
	10	Ayrshire -	6	Apr. 3	960	14 0	9 9	12 8	10 1	13 8	9 11	14 8	9 0	13 4	9 7	13 4	9 4	15 0	9 10	162 10	23 4
	11	Guernsey -	4	Mar. 30	834	10 2	7 11	11 0	7 2	11 0	8 1	10 8	7 0	11 4	7 8	11 10	8 2	12 4	7 12	131 0	18 11
	12	Cross Sht.-horn	7	Nov. 16	1,146	12 8	8 3	12 10	8 4	10 8	5 6	10 3	7 6	10 0	6 12	10 11	8 3	10 3	6 8	127 5	18 3
		Total -			13,275	122 6	90 14	121 10	85 1	118 14	88 11	123 15	83 5	120 1	86 11	127 6	88 9	125 6	87 1	1,469 14	—
		Means -			1,106	10 3	7 9	10 2	7 2	9 15	7 6	10 5	6 15	10 0	7 4	10 10	7 6	10 7	7 4	122 8	17 8

Table IX.—*continued.*

Detailed Record of Food consumed, and Milk yielded, by Cows fed on the Unsewaged and Sewaged Meadow Grass, with Oilcake in addition.

Second Season, 1862; 7 days.—September 26 to October 2.

THREE COWS.—UNSEWAGED GRASS.

		Friday.	Saturday.	Sunday.	Monday.	Tuesday.	Wednesday.	Thursday.	Total in 7 days.	Per head per day.
Food consumed.	From which Field, Plot, and Crop.	..	Ten-acre, Plot 0*, Crop 2.	Ten-acre, Plot 0*, Crop 2.	Ten-acre, Plot 0*, Crop 2.	Ten-acre, Plot 0*, Crop 3.	Ten-acre, Plot 0*, Crop 3.	Ten-acre, Plot 0*, Crop 3.	—	—
Grass	Quantities weighed	tons. cwts. qrs. lbs. —	tons. cwts. qrs. lbs. 0 3 1 12	tons. cwts. qrs. lbs. 0 4 0 19	tons. cwts. qrs. lbs. 0 4 0 19	tons. cwts. qrs. lbs. 0 3 1 10	tons. cwts. qrs. lbs. 0 3 0 22	tons. cwts. qrs. lbs. 0 3 1 12	tons. cwts. qrs. lbs. 1 1 2 10	tons. cwts. qrs. lbs. 0 1 0 3
Oilcake (3 parts linseed and 2 parts rape cake)		0 0 0 15	0 0 0 15	0 0 0 15	0 0 0 15	0 0 0 15	0 0 0 15	0 0 0 15	0 0 3 21	0 0 0 5

Yield of Milk, &c.	Cows. Nos.	Breed.	Years old.	Dates of Calving.	Weights (Sept. 18). lbs.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	—	—
						lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.
	1	Cross Sht.-horn	6	Mar. 20	1,066	14 0	9 8	14 0	9 4	14 3	8 3	12 4	10 6	14 0	9 12	14 8	9 10	14 0	9 3	162 13	23 4
	2	Cross Sht.-horn	7	Dec. 25	1,190	5 6	5 8	3 8	5 12	3 10	5 2	2 2	4 2	2 8	3 11	2 6	4 0	2 0	2 0	51 11	7 6
	3	Cross Sht.-horn	Aged	Feb. 26	1,020	14 12	10 14	15 4	10 7	14 7	9 12	12 2	12 2	14 2	10 15	15 6	9 12	16 2	9 7	175 8	25 1
			Totals	-	3,276	34 2	25 14	32 12	25 7	32 4	23 1	26 8	26 10	30 10	24 6	32 4	23 6	32 2	20 10	390 0	—
			Means	-	1,092	11 6	8 10	10 15	8 8	10 12	7 11	8 13	8 14	10 3	8 2	10 12	7 13	10 11	6 14	130 0	18 9

TWELVE COWS.—SEWAGED GRASS.

		Friday.	Saturday.	Sunday.	Monday.	Tuesday.	Wednesday.	Thursday.	Total in 7 days.	Per head per day.
Food consumed.	From which Field, Plot, and Crop.	Five-acre, Plot 3, Crop 3.	Five-acre, Plot 3, Crop 3.	Five-acre, Plot 3, Crop 3.	Five-acre, Plot 3, Crop 3.	†	Ten-acre, Plot 2, Crop 3.	Ten-acre, Plot 2, Crop 3.	—	—
Grass	Quantities weighed	tons. cwts. qrs. lbs. 1 0 2 5	tons. cwts. qrs. lbs. 0 17 0 23	tons. cwts. qrs. lbs. 0 16 3 7	tons. cwts. qrs. lbs. 0 16 3 3	tons. cwts. qrs. lbs. 0 15 0 20	tons. cwts. qrs. lbs. 0 15 1 25	tons. cwts. qrs. lbs. 0 12 2 9	tons. cwts. qrs. lbs. 5 14 2 8	tons. cwts. qrs. lbs. 0 1 1 13
Oilcake (3 parts linseed and 2 parts rape cake)		0 0 2 4	0 0 2 4	0 0 2 4	0 0 2 4	0 0 2 4	0 0 2 4	0 0 2 4	0 3 3 0	0 0 0 5

Yield of Milk, &c.	Cows. Nos.	Breed.	Years old.	Dates of Calving.	Weights (Sept. 18). lbs.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	—	—
						lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.
	1	Cross Sht.-horn	6	Nov. 18	1,270	10 2	7 11	10 14	7 8	11 0	7 6	10 6	7 4	10 12	8 0	10 14	8 0	11 13	7 11	129 5	18 3
	2	Cross Sht.-horn	8	Feb. 2	1,267	6 8	5 10	6 9	5 6	7 1	5 3	7 0	4 12	6 0	4 13	6 13	4 15	6 11	5 0	82 5	11 12
	3	Cross Sht.-horn	6	Dec. 1	1,288	7 9	4 11	7 6	5 6	7 6	5 10	7 2	4 13	7 0	4 14	6 10	4 3	6 0	4 4	82 14	11 13
	4	Cross Sht.-horn	Aged	Jan. 26	978	7 14	6 1	7 11	6 6	7 10	6 12	7 4	5 10	7 4	5 4	8 6	5 14	8 4	5 8	95 12	13 11
	5	Cross Sht.-horn	6	Nov. 17	1,199	6 5	5 2	6 3	4 12	6 12	4 13	6 3	4 10	5 6	4 15	5 6	4 7	5 6	4 8	74 12	10 11
	6	Cross Sht.-horn	Aged	Jan. 13	1,150	11 6	9 2	11 12	8 6	11 10	8 3	10 1	7 10	10 4	7 15	11 0	7 12	10 4	8 6	133 11	19 2
	7	Cross Sht.-horn	6	May 2	1,106	15 2	11 0	15 6	10 4	14 10	10 13	12 10	9 4	13 1	9 12	14 3	10 10	13 12	9 4	169 11	24 4
	8	Cross Ayrshire	3	Apr. 13	850	11 6	8 1	11 14	7 11	12 1	7 0	12 1	6 2	11 0	7 4	11 10	7 15	11 3	6 15	132 3	18 14
	9	Cross Sht.-horn	Aged	Feb. 16	1,232	10 7	7 1	11 12	7 8	11 6	7 4	10 4	7 1	10 8	7 6	10 2	7 12	10 12	6 7	125 4	17 14
	10	Ayrshire	6	Apr. 3	960	14 6	7 9	15 4	9 14	16 0	9 2	14 5	8 12	13 0	10 3	14 6	9 4	13 8	9 1	164 10	23 8
	11	Guernsey	4	Mar. 30	834	11 10	8 6	12 4	8 4	12 2	7 7	10 8	7 4	10 12	7 8	11 2	8 3	10 8	8 2	134 0	19 2
	12	Cross Sht.-horn	7	Nov. 16	1,146	10 8	7 1	11 0	7 6	11 8	7 3	10 14	8 14	10 10	8 3	10 5	6 14	10 2	6 15	127 7	18 3
			Totals	-	13,275	123 3	87 7	127 15	88 11	129 2	86 12	118 10	82 0	115 9	85 11	120 13	85 13	118 3	82 1	1,451 14	—
			Means	-	1,106	10 4	7 5	10 11	7 6	10 12	7 4	9 14	6 13	9 10	7 2	10 1	7 3	9 14	6 13	121 0	17 5

Detailed Record of Food consumed, and Milk yielded, by Cows fed on the Unsewaged and Sewaged Meadow Grass, with Oilcake in addition.

Second Season, 1862 ; 7 days.—October 3 to October 9.

Three Cows.—Unsewaged Grass.

	From which Field, Plot, and Crop.	Friday.	Saturday.	Sunday.	Monday.	Tuesday.	Wednesday.	Thursday.	Total in 7 days.	Per head per day.
Food consumed.	Grass	Ten-acre, Plot 0,* Crop 3.	Ten-acre, Plot 0,* Crop 2.	Ten-acre, Plot 0,* Crop 2.	Ten-acre, Plot 0,* Crop 2.	†	†	†	—	—
	Quantities weighed	tons. cwts. qrs. lbs. 0 2 1 9	0 1 3 15	0 1 2 24	0 1 2 24	0 3 3 22	0 3 3 17	0 2 3 6	0 18 1 5	0 0 3 14
	Oilcake (3 parts linseed and 2 parts rape cake)	0 0 0 15	0 0 0 15	0 0 0 15	0 0 0 15	0 0 0 15	0 0 0 15	0 0 0 15	0 0 3 21	0 0 0 5

Yield of Milk, &c.	Cows. Nos.	Breed.	Years old.	Dates of Calving.	Weights (Sept. 18). lbs.	Friday. A.M.	Friday. P.M.	Saturday. A.M.	Saturday. P.M.	Sunday. A.M.	Sunday. P.M.	Monday. A.M.	Monday. P.M.	Tuesday. A.M.	Tuesday. P.M.	Wednesday. A.M.	Wednesday. P.M.	Thursday. A.M.	Thursday. P.M.	Total in 7 days.	Per head per day.
						lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	—	—
	1	Cross Sht.-horn	6	Mar. 20	1,066	14 2	9 11	13 8	9 13	13 2	9 6	14 10	9 5	13 2	10 0	13 8	9 14	13 3	9 4	162 8	23 3
	2	Cross Sht.-horn	7	Dec. 25	1,190	3 4	3 6	3 6	2 7	2 12	2 5	1 12	3 15	1 10	3 8	1 12	2 8	2 4	2 0	36 13	5 4
	3	Cross Sht.-horn	Aged	Feb. 26	1,020	14 8	9 15	15 2	10 4	10 6	10 7	13 8	9 7	14 12	11 2	14 4	10 11	13 4	9 15	167 9	23 15
		Totals -			3,276	31 14	23 0	32 0	22 8	26 4	22 2	29 14	22 11	29 8	24 10	29 8	23 1	28 11	21 3	366 14	—
		Means -			1,092	10 10	7 11	10 11	7 8	8 12	7 6	9 15	7 9	9 14	8 3	9 13	7 11	9 9	7 1	122 5	17 8

Twelve Cows.—Sewaged Grass.

	From which Field, Plot, and Crop.	Friday.	Saturday.	Sunday.	Monday.	Tuesday.	Wednesday.	Thursday.	Total in 7 days.	Per head per day.
Food consumed.	Grass	Ten-acre, Plot 2, Crop 3.	Ten-acre, Plot 2, Crop 3.	Ten-acre, Plot 2, Crop 3 & Plot 4, Crop 4.	Ten-acre, Plot 2, Crop 3 & Plot 4, Crop 4.	†	†	†	—	—
	Quantities weighed	tons. cwts. qrs. lbs. 0 14 2 5	0 13 2 27	0 13 3 0	0 13 3 1	0 19 0 21	0 16 2 25	0 13 3 7	5 5 2 2	0 1 1 1
	Oilcake (3 parts linseed and 2 parts rape cake)	0 0 2 4	0 0 2 4	0 0 2 4	0 0 2 4	0 0 2 4	0 0 2 4	0 0 2 4	0 3 3 0	0 0 0 5

Yield of Milk, &c.	Cows. Nos.	Breed.	Years old.	Dates of Calving.	Weights (Sept. 18). lbs.	Friday. A.M.	Friday. P.M.	Saturday. A.M.	Saturday. P.M.	Sunday. A.M.	Sunday. P.M.	Monday. A.M.	Monday. P.M.	Tuesday. A.M.	Tuesday. P.M.	Wednesday. A.M.	Wednesday. P.M.	Thursday. A.M.	Thursday. P.M.	Total in 7 days.	Per head per day.
						lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	—	—
	1	Cross Sht.-horn	6	Nov. 18	1,270	10 10	8 0	11 2	7 6	11 0	7 0	10 11	6 4	10 7	7 2	10 11	7 8	10 13	7 0	125 10	17 15
	2	Cross Sht.-horn	8	Feb. 2	1,267	6 9	5 0	5 12	5 6	8 1	4 15	6 10	5 2	6 2	5 3	7 1	5 4	7 3	5 0	84 4	12 1
	3	Cross Sht.-horn	6	Dec. 1	1,288	6 1	4 6	6 0	3 12	5 2	3 7	4 0	2 7	3 1	..	..	1 12	2 6	1 15	44 5	6 5
	4	Cross Sht.-horn	Aged	Jan. 26	973	7 5	6 4	7 14	6 2	8 6	6 0	7 6	5 2	7 9	5 4	7 3	4 8	7 0	4 10	90 9	12 15
	5	Cross Sht.-horn	6	Nov. 17	1,199	5 11	5 3	5 10	4 10	6 4	4 8	6 0	4 7	6 2	4 9	5 11	4 8	5 7	4 3	72 13	10 6
	6	Cross Sht.-horn	Aged	Jan. 13	1,150	10 11	8 6	11 1	7 10	11 8	7 3	10 11	7 14	10 12	8 5	10 13	8 4	10 11	7 10	131 1	18 12
	7	Cross Sht.-horn	6	May 2	1,106	14 0	10 12	10 0	13 8	11 2	9 0	14 10	9 9	13 8	10 7	13 11	10 2	13 9	8 9	162 7	23 3
	8	Cross Ayrshire	3	Apr. 13	850	10 12	7 6	11 8	7 9	11 2	7 8	11 8	6 6	10 12	7 12	11 7	7 1	10 7	6 15	128 1	18 5
	9	Cross Sht.-horn	Aged	Feb. 16	1,232	10 0	7 10	10 4	7 2	10 8	6 14	10 11	7 2	9 12	7 9	10 0	6 15	10 4	5 10	120 5	17 3
	10	Ayrshire -	6	Apr. 3	960	13 10	9 0	13 13	9 4	14 12	8 11	13 11	8 11	13 12	9 6	14 8	8 10	13 4	8 10	159 10	22 13
	11	Guernsey -	4	Mar. 30	834	11 3	7 6	11 2	8 5	12 8	7 8	11 2	7 5	10 9	9 0	10 8	7 6	10 2	7 15	131 15	18 14
	12	Cross Sht.-horn	7	Nov. 16	1,146	10 12	7 10	10 14	6 4	10 12	6 8	10 1	6 10	9 14	7 1	10 12	7 14	10 4	7 10	122 14	17 9
		Totals -			13,275	117 4	86 9	116 0	86 14	121 1	79 2	117 1	76 15	112 4	81 10	112 5	79 12	111 6	75 11	1,373 14	—
		Means -			1,106	9 12	7 3	9 11	7 4	10 1	6 9	9 12	6 7	9 6	6 13	9 6	6 10	9 5	6 5	114 8	16 6

* Unmeasured land, designated Plot 0 when unsewaged. † Not experimental. ‡ This cow calved again Oct. 7, 1862.

Table IX.—*continued.*

Detailed Record of Food consumed, and Milk yielded, by Cows fed on the Unsewaged and Sewaged Meadow Grass, with Oilcake in addition.

Second Season, 1862 ; 7 days.—October 10 to October 16.

						Friday.		Saturday.		Sunday.		Monday.		Tuesday.		Wednesday.		Thursday.		Total in 7 days.		Per head per day.	
THREE COWS.—UNSEWAGED GRASS.																							
Food consumed.	Grass	From which Field, Plot, and Crop.				*		*		*		*		Ten-acre, Plot 0†, Crop 2.		—		*		—		—	
		Quantities weighed				*tons. cwts. qrs. lbs.*		*tons. cwts. qrs. lbs.*		*tons. cwts. qrs. lbs.*		*tons. cwts. qrs. lbs.*		*tons. cwts. qrs. lbs.*		*tons. cwts. qrs. lbs.*		*tons. cwts. qrs. lbs.*		*tons. cwts. qrs. lbs.*		*tons. cwts. qrs. lbs.*	
						0 4 0 0		0 3 1 10		0 3 0 27		0 3 1 0		0 4 0 20		—		0 4 0 0		1 2 0 1		0 1 0 5	
		Oilcake (3 parts linseed and 2 parts rape cake)				0 0 0 15		0 0 0 15		0 0 0 15		0 0 0 15		0 0 0 15		0 0 0 15		0 0 0 15		0 0 3 21		0 0 0 5	
Yield of Milk, &c.	Cows. Nos.	Breed.	Years old.	Dates of Calving.	Weights (Oct. 16). *lbs.*	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	—		—	
						lbs. ozs.	*lbs. ozs.*	*lbs. ozs.*	*lbs. ozs.*	*lbs. ozs.*	*lbs. ozs.*	*lbs. ozs.*	*lbs. ozs.*	*lbs. ozs.*	*lbs. ozs.*	*lbs. ozs.*	*lbs. ozs.*	*lbs. ozs.*	*lbs. ozs.*	*lbs. ozs.*		*lbs. ozs.*	
	1	Cross Sht.-horn	6	Mar. 20	1,038	12 4	9 0	12 1	8 10	12 3	8 4	13 0	8 6	13 12	8 5	13 0	7 14	12 0	8 3	148 15		21 4	
	2	Cross Sht.-horn	7	Dec. 25	1,219	3 12	2 1	3 6	2 2	2 0	2 9	1 12	1 6	1 14	2 15	1 11	3 8	1 8	2 2	31 10		4 8	
	3	Cross Sht.-horn	Aged	Feb. 26	1,058	13 8	10 8	13 11	9 4	13 8	11 8	13 0	10 6	13 0	10 1	13 1	8 6	13 11	8 15	162 7		23 3	
				Totals -	3,335	29 8	21 9	28 2	20 0	27 10	22 5	29 12	20 2	28 10	21 5	27 12	19 12	27 5	19 4	343 0		—	
				Means -	1,112	9 13	7 3	9 6	6 11	9 3	7 7	9 14	6 11	9 9	7 2	9 4	6 9	9 2	6 7	114 5		16 5	
TWELVE COWS.—SEWAGED GRASS.																							
Food consumed.	Grass	From which Field, Plot, and Crop.				*		Ten-acre, Plot 4, Crop 4.		*		*		Ten-acre, Plot 4, Crop 4.		Ten-acre, Plot 3, Crop 4.		Ten-acre, Plot 3, Crop 4.		—		—	
		Quantities weighed				*tons. cwts. qrs. lbs.*		*tons. cwts. qrs. lbs.*		*tons. cwts. qrs. lbs.*		*tons. cwts. qrs. lbs.*		*tons. cwts. qrs. lbs.*		*tons. cwts. qrs. lbs.*		*tons. cwts. qrs. lbs.*		*tons. cwts. qrs. lbs.*		*tons. cwts. qrs. lbs.*	
						0 14 1 0		1 5 1 9		0 15 3 26		0 15 3 26		0 17 0 5		0 12 1 0		0 19 1 0		6 0 0 10		0 1 1 20	
		Oilcake (3 parts linseed and 2 parts rape cake)				0 0 2 4		0 0 2 4		0 0 2 4		0 0 2 4		0 0 2 4		0 0 2 4		0 0 2 4		0 3 3 0		0 0 0 3	
Yield of Milk, &c.	Cows. Nos.	Breed.	Years old.	Dates of Calving.	Weights (Oct. 16). *lbs.*	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	—		—	
						lbs. ozs.	*lbs. ozs.*	*lbs. ozs.*	*lbs. ozs.*	*lbs. ozs.*	*lbs. ozs.*	*lbs. ozs.*	*lbs. ozs.*	*lbs. ozs.*	*lbs. ozs.*	*lbs. ozs.*	*lbs. ozs.*	*lbs. ozs.*	*lbs. ozs.*	*lbs. ozs.*		*lbs. ozs.*	
	1	Cross Sht.-horn	6	Nov. 18	1,288	10 4	7 15	10 11	8 2	10 7	6 12	10 4	7 7	11 6	7 14	11 1	7 3	10 15	7 5	127 10		18 4	
	2	Cross Sht.-horn	8	Feb. 2	1,270	6 8	5 3	6 10	4 12	6 11	5 0	6 2	4 14	5 14	5 0	5 12	5 1	5 13	4 7	77 11		11 2	
	‡3	Cross Sht.-horn	6	Dec. 1	1,223	3 14	3 8	4 14	3 0	5 0	4 4	5 14	3 9	6 14	3 9	7 1	4 0	7 0	4 7	66 14		9 9	
	4	Cross Sht.-horn	Aged	Jan. 26	936	6 9	5 3	6 11	5 2	6 5	4 10	6 3	4 14	6 0	4 12	5 14	3 12	5 12	4 8	76 3		10 14	
	5	Cross Sht.-horn	6	Nov. 17	1,214	5 0	4 11	5 2	4 8	5 3	4 12	5 11	4 1	5 2	4 8	5 3	4 4	4 11	4 4	67 0		9 9	
	6	Cross Sht.-horn	Aged	Jan. 13	1,169	10 0	8 6	10 1	8 15	10 4	7 14	10 4	7 10	10 9	7 12	10 14	7 3	10 10	7 3	127 9		18 4	
	7	Cross Sht.-horn	6	May 2	1,101	13 1	9 14	14 11	10 9	13 12	10 12	13 8	9 12	12 8	10 4	13 0	9 5	12 6	9 8	162 14		23 4	
	8	Cross Ayrshire	3	Apr. 13	868	10 12	7 5	10 3	8 4	11 2	7 8	12 4	6 9	10 2	7 9	11 8	7 0	11 0	7 10	128 12		18 6	
	9	Cross Sht.-horn	Aged	Feb. 16	1,224	7 4	7 4	10 6	5 11	10 4	7 8	10 0	6 15	10 6	7 4	10 9	6 14	10 8	7 12	118 9		16 15	
	10	Ayrshire	6	Apr. 3	975	13 0	9 6	13 0	9 9	12 8	8 12	14 2	7 13	12 6	9 2	13 6	8 7	12 0	8 9	152 0		21 11	
	11	Guernsey	4	Mar. 30	830	11 0	7 15	11 0	8 0	11 0	7 4	11 6	6 8	10 2	8 2	11 2	7 13	10 14	7 13	129 15		18 9	
	12	Cross Sht.-horn	7	Nov. 16	1,098	10 14	8 15	10 12	7 11	11 1	7 8	11 4	7 10	11 7	7 12	11 4	7 10	11 0	8 14	133 10		19 1	
				Totals -	13,196	108 2	85 9	114 1	84 3	113 9	82 8	116 14	77 10	112 12	83 8	116 10	78 8	112 9	82 4	1,368 11		—	
				Means -	1,099	9 0	7 2	9 8	7 0	9 7	6 14	9 12	6 7	9 6	7 0	9 12	6 9	9 6	6 14	114 1		16 5	

* Not experimental.

† Unmeasured land, designated Plot 0 when unsewaged.

‡ This cow calved again Oct. 7, 1862.

Detailed Record of Food consumed, and Milk yielded, by Cows fed on Unsewaged and Sewaged Meadow Grass, and on Italian Rye Grass (without Oilcake).
Third Season, 1863 ; 7 days.—April 28 to May 4.

Five Cows.*—Unsewaged Meadow Grass.

Grass consumed.	From which Field, Plot, and Crop		Tuesday.	Wednesday.	Thursday.	Friday.	Saturday.	Sunday.	Monday.	Total in 7 days.	Per head per day.
	Quantities weighed (*tons. cwts. qrs. lbs.*)		0 3 0 0	0 5 2 0	0 7 0 0	0 7 2 0	0 6 0 0	0 3 0 8	0 3 0 7	1 15 0 15	0 1 0 0
	From which Field, Plot, and Crop		Rye, Plot 2, Crop 1.	Rye, Plot 1, Crop 1.	Rye, Plot 1, Crop 1.	Rye, Plot 1, Crop 1.	Rye, Plot 1, Crop 1.	Rye, Plot 1, Crop 1.	Rye, Plot 1, Crop 1.	—	—

Yield of Milk, &c.	Cows. Nos.	Breed.	Years old.	Dates of Calving.	Weights (April 27) lbs.	A.M. lbs.	A.M. qrs.	P.M. lbs.	P.M. qrs.	A.M. lbs.	A.M. qrs.	P.M. lbs.	P.M. qrs.	A.M. lbs.	A.M. qrs.	P.M. lbs.	P.M. qrs.	A.M. lbs.	A.M. qrs.	P.M. lbs.	P.M. qrs.	A.M. lbs.	A.M. qrs.	P.M. lbs.	P.M. qrs.	— lbs.	— qrs.	— lbs.	— qrs.
	1	Cross short-horn	Aged	Mar. 1	1,042	17	0	12	8	18	10	11	9	16	2	14	4	18	2	11	8	15	8	13	6	17	0	10	0	19	4	12	6	207	12	29	11
	2	Cross short-horn	6	Feb. 15	1,117	20	5	15	8	18	4	16	3	19	0	12	12	18	0	15	4	16	11	15	8	17	8	16	3	20	8	14	4	235	14	33	11
	3	Cross short-horn	3	April 13	746	17	10	12	14	16	4	10	12	13	10	15	1	16	6	11	5	16	12	12	2	18	2	12	1	18	8	9	3	200	10	28	10
	4	Cross short-horn	7	Feb. 17	1,089	18	6	13	8	17	8	12	1	15	4	14	12	15	1	11	10	13	11	11	14	8	11	6	0	11	10	8	0	178	0	25	7
	5	Cross short-horn	7	April 17	1,058	16	6	13	14	16	0	17	4	17	1	17	3	19	0	11	14	18	6	12	11	20	2	15	0	19	8	15	11	230	0	32	14
				Totals	5,052	89	11	68	4	86	10	67	13	81	1	74	0	86	9	61	9	81	0	65	9	82	0	59	4	89	6	59	8	1,052	4	—	
				Means	1,010	17	15	13	10	17	5	13	9	16	4	14	13	17	5	12	5	16	3	13	2	16	6	11	14	17	14	11	14	210	7	30	1

Ten Cows.—Sewaged Meadow Grass.

Grass consumed.	From which Field, Plot, and Crop		Five-acre, Plot 4, Crop 1.	Five-acre, Plot 4, Crop 1.	—	Ten-acre, Plot 4, Crop 1.	Five-acre, Plot 4, Crop 1.	Five-acre, Plot 4, Crop 1.	Five-acre, Plot 4, Crop 1.	—	—
	Quantities weighed (*tons. cwts. qrs. lbs.*)		0 17 1 23	0 17 1 17		0 6 3 23	0 12 1 23	0 8 0 3	0 8 0 3	3 10 1 8	0 1 0 1

Yield of Milk, &c.	Cows. Nos.	Breed.	Years old.	Dates of Calving.	Weights (April 27) lbs.	A.M. lbs.	A.M. qrs.	P.M. lbs.	P.M. qrs.	A.M. lbs.	A.M. qrs.	P.M. lbs.	P.M. qrs.	A.M. lbs.	A.M. qrs.	P.M. lbs.	P.M. qrs.	A.M. lbs.	A.M. qrs.	P.M. lbs.	P.M. qrs.	A.M. lbs.	A.M. qrs.	P.M. lbs.	P.M. qrs.	— lbs.	— qrs.	— lbs.	— qrs.
	1	Cross short-horn	Aged	Mar. 10	1,064	20	6	14	13	18	12	15	13	16	12	15	12	16	8	15	8	17	1	15	12	18	8	18	0	18	4	13	5	235	2	33	9
	2	Cross short-horn	Aged	April 7	1,036	21	12	18	10	22	1	14	12	21	4	14	4	21	6	13	4	20	10	16	8	25	6	15	10	23	2	14	10	263	3	37	10
	3	Cross short-horn	6	Feb. 26	1,030	17	11	14	9	18	0	13	14	16	6	12	11	15	12	13	2	16	2	14	3	17	0	13	7	18	1	13	9	214	7	30	10
	4	Cross short-horn	7	Feb. 15	1,036	17	12	12	11	15	10	12	10	14	0	12	10	14	14	11	4	14	0	12	0	16	2	12	2	17	6	12	2	195	3	27	14
	5	Ayrshire – –	8	Feb. 22	1,092	16	8	13	12	16	3	10	12	14	10	9	11	15	6	10	11	14	4	11	0	13	0	13	8	15	4	11	0	185	9	26	8
	6	Cross short-horn	6	April 14	889	19	10	10	8	18	6	11	10	20	1	12	2	15	8	14	0	17	6	10	10	18	14	13	0	18	6	12	4	212	5	30	5
	7	Mongrel – –	Aged	April 12	868	10	0	10	10	12	1	9	5	15	2	9	9	15	11	10	8	17	8	11	4	17	4	11	0	17	4	11	0	192	0	27	7
	8	Cross short-horn	6	April 16	960	11	6	11	1	12	3	9	11	10	4	10	1	13	6	11	0	12	4	10	14	12	0	11	1	11	10	12	6	159	3	22	12
	9	Cross short-horn	7	April 13	906	18	0	11	12	10	2	13	2	17	2	13	8	16	7	12	0	18	1	14	7	21	10	14	7	21	8	14	8	225	10	32	4
	10	Half short-horn	Aged	Oct. 30	1,320	15	3	12	12	12	11	9	3	12	9	8	8	13	0	11	1	12	0	7	13	13	0	12	2	14	1	11	0	164	15	23	9
				Totals	10,942	177	4	131	4	171	0	123	8	153	0	118	8	157	5	121	7	157	7	123	11	173	0	134	9	174	14	125	12	2,047	9	—	
				Means	1,004	17	11	13	2	17	1	12	6	15	13	11	14	15	12	12	2	15	12	12	6	17	5	13	7	17	8	12	9	204	12	29	4

Five Cows.—Unsewaged or Sewaged Italian Rye Grass.

Grass consumed.	From which Field, Plot, and Crop		Rye, Plot 2, Crop 1.	Rye, Plot 1, Crop 1.	Rye, Plot 1, Crop 1.	Rye, Plot 1, Crop 1.	Rye, Plot 1, Crop 1.	Rye, Plot 1, Crop 1.	Rye, Plot 1, Crop 1.	—	—
	Quantities weighed (*tons. cwts. qrs. lbs.*)		0 3 0 0	0 6 1 0	0 6 3 7	0 7 2 20	0 5 1 0	0 3 0 6	0 3 0 6	1 15 0 11	0 1 0 0

Yield of Milk, &c.	Cows. Nos.	Breed.	Years old.	Dates of Calving.	Weights (April 27) lbs.	A.M. lbs.	A.M. qrs.	P.M. lbs.	P.M. qrs.	A.M. lbs.	A.M. qrs.	P.M. lbs.	P.M. qrs.	A.M. lbs.	A.M. qrs.	P.M. lbs.	P.M. qrs.	A.M. lbs.	A.M. qrs.	P.M. lbs.	P.M. qrs.	A.M. lbs.	A.M. qrs.	P.M. lbs.	P.M. qrs.	— lbs.	— qrs.	— lbs.	— qrs.
	1	Cross short-horn	Aged	April 20	1,066	25	6	15	3	25	1	17	0	24	4	20	10	23	8	16	9	21	13	18	4	20	8	15	11	27	9	15	0	286	6	40	15
	2	Ayrshire – –	6	Mar. 15	874	22	8	17	2	22	10	16	14	22	3	16	1	21	12	14	1	21	8	14	5	21	0	13	6	23	2	15	8	262	0	37	7
	3†	Cross short-horn	Aged	May 1	1,020	15	10	9	2	27	6	16	8	27	4	20	14	22	10	19	14	..	..	..	..	..	..	..	..	..	..	..	..	159	5	39	13
	4	Cross short-horn	Aged	April 15	1,185	24	6	17	14	21	2	12	9	22	10	19	8	23	4	15	14	23	1	14	12	27	0	13	8	25	10	13	12	280	14	40	2
	5	Half short-horn	4	Feb. 8	1,114	15	9	15	13	20	4	12	0	19	0	11	9	18	12	11	2	18	0	10	10	17	12	10	2	18	8	11	0	210	1	30	0
				Totals	5,259	103	7	75	3	116	7	81	15	115	5	88	10	108	14	77	8	84	6	57	15	86	4	52	11	94	13	55	4	1,039	5	—	
				Means	1,052	20	11	15	1	23	5	16	6	23	1	17	12	21	12	15	8	21	2	14	8	21	9	13	3	23	11	13	13	239	13	37	11

* Rye grass was given to these cows until the unsewaged meadow grass was ready for cutting.
† The No. 3 cow on rye grass, first put up, and whose milk is entered for the first four days, died on May 2, and was replaced on May 5 by the one whose description and weight are given in the Table.

Table X.—*continued.*

Detailed Record of Food consumed, and Milk yielded, by Cows fed on Unsewaged and Sewaged Meadow Grass, and on Italian Rye Grass (without Oilcake).
Third Season, 1863 ; 7 days.—May 5 to May 11.

					Tuesday.		Wednesday.		Thursday.		Friday.		Saturday.		Sunday.		Monday.		Total in 7 days.	Per head per day.
Five Cows.*—Unsewaged Meadow Grass.																				
Grass consumed.	From which Field, Plot, and Crop				Rye, Plot 1, Crop 1.		Rye, Plot 0†, Crop 1.		Rye, Plot 0†, Crop 1.		Rye, Plot 0†, Crop 1.		Rye, Plot 0†, Crop 1.		Rye, Plot 0†, Crop 1.		Rye, Plot 0†, Crop 1.		—	—
	Quantities weighed (*tons. cwts. qrs. lbs.*)				0 6 2 2		0 9 0 16		0 4 0 0		0 5 2 20		0 6 1 16		0 3 2 7		0 3 2 6		1 18 3 11	0 1 0 12
Yield of Milk, &c.	Cows. Nos.	Breed.	Years old.	Dates of Calving.	Weights (Apr. 27). *lbs.*		A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	—	—
							lbs. ozs.	*lbs. ozs.*	*lbs. ozs.*	*lbs. ozs.*	*lbs. ozs.*	*lbs. ozs.*	*lbs. ozs.*	*lbs. ozs.*	*lbs. ozs.*	*lbs. ozs.*	*lbs. ozs.*	*lbs. ozs.*	*lbs. ozs.*	*lbs. ozs.*
	1	Cross short-horn	Aged	Mar. 1	1,042		18 4	11 15	17 6	10 4	17 4	10 0	17 13	11 8	18 8	10 4	18 14	10 11	240 3	28 10
	2	Cross short-horn	6	Feb. 15	1,117		20 4	12 8	18 2	13 8	18 8	11 8	20 1	12 4	19 1	12 3	18 6	12 15	221 14	31 11
	3	Cross short-horn	3	April 13	746		17 12	11 10	17 12	10 8	17 4	11 9	16 10	11 1	17 0	10 10	15 6	9 12	192 12	27 8
	4	Cross short-horn	7	Feb. 17	1,039		9 8	9 0	11 1	9 10	10 10	9 7	10 0	5 15	12 4	8 11	12 0	3 15	134 12	19 4
	5	Cross short-horn	7	April 17	1,038		16 4	13 5	20 2	12 11	21 0	13 4	20 8	11 13	20 11	13 0	21 4	13 4	231 6	33 1
				Totals	5,052		82 0	58 6	84 7	56 9	84 10	55 12	85 0	51 1	87 8	54 12	85 14	50 9	980 15	—
				Means	1,010		16 6	11 11	16 14	11 5	16 15	11 2	17 0	10 4	17 8	10 15	17 3	10 2	196 3	28 0
Ten Cows.—Sewaged Meadow Grass.																				
Grass consumed.	From which Field, Plot, and Crop				Five-acre, Plot 4, Crop 1.		Five-acre, Plot 4, Crop 1.		Five-acre, Plot 4, Crop 1.		—		Ten-acre, Plot 4. Crop 1.		Five-acre, Plot 4, Crop 1.		Five-acre, Plot 4, Crop 1.		—	—
	Quantities weighed (*tons. cwts. qrs. lbs.*)				0 15 1 19		0 12 0 6		0 13 2 22		—		0 17 0 10		0 9 0 17		0 9 0 16		3 16 2 6	0 1 0 10
Yield of Milk, &c.	1	Cross short-horn	Aged	Mar. 10	1,054		18 0	15 1	20 10	16 1	19 6	14 3	21 4	15 6	19 8	15 14	20 0	15 8	19 4	13 1	243 2	34 12
	2	Cross short horn	Aged	April 7	1,036		24 2	17 0	25 2	16 8	25 4	18 0	25 8	18 3	26 12	18 7	28 7	18 3	26 3	17 2	304 13	43 9
	3	Cross short horn	6	Feb. 20	1,030		17 4	13 11	16 8	11 10	16 6	14 9	17 3	12 4	18 10	13 9	18 0	14 1	20 8	12 13	218 0	31 2
	4	Cross short-horn	7	Feb. 15	1,036		17 9	13 8	18 0	12 8	16 14	13 0	17 14	12 10	17 0	12 4	17 2	13 12	16 12	12 0	210 13	30 2
	5	Ayrshire – –	8	Feb. 22	1,002		15 6	12 1	17 4	12 0	16 11	11 8	17 4	10 10	16 9	11 6	17 10	11 9	16 10	10 6	196 14	28 2
	6	Cross short-horn	6	April 14	880		18 8	14 7	20 12	14 2	20 9	14 6	19 2	13 11	18 11	13 15	21 6	14 0	19 13	13 8	236 14	33 13
	7	Mongrel – –	Aged	April 12	808		16 1	11 6	17 2	11 2	15 3	10 13	14 12	10 4	16 6	11 1	16 6	12 0	17 3	11 2	173 12	24 13
	8	Cross short-horn	6	April 16	960		13 1	6 8	9 2	7 1	14 1	11 6	17 0	12 14	16 7	11 2	16 1	10 12	17 3	11 2	145 4	35 1
	9	Cross short-horn	7	April 13	906		19 12	16 0	21 15	14 1	20 1	14 2	20 4	13 10	20 10	14 5	20 2	15 11	20 0	14 11	162 2	23 3
	10	Half short horn	Aged	Oct. 30	1,320		12 6	9 12	13 2	10 5	13 2	10 1	13 2	10 14	12 0	10 11	13 0	10 6	13 10	9 11		
				Totals	10,042		172 0	129 6	179 9	125 6	177 9	132 0	183 5	131 6	182 9	132 10	188 2	135 14	183 15	125 0	2,178 11	—
				Means	1,004		17 3	12 15	18 0	12 9	17 12	13 3	18 5	13 2	18 4	13 4	18 13	13 10	18 6	12 8	217 14	31 2
Five Cows.—Unsewaged or Sewaged Italian Rye Grass.																				
Grass consumed.	From which Field, Plot, and Crop				Rye, Plot 1, Crop 1.		Rye, Plot 0†, Crop 1.		Rye, Plot 0†, Crop 1.		Rye, Plot 0†, Crop 1.		Rye, Plot 0†, Crop 1.		Rye, Plot 0†, Crop 1.		Rye, Plot 0†, Crop 1.		—	—
	Quantities weighed (*tons. cwts. qrs. lbs.*)				0 7 3 13		0 9 2 0		0 4 1 6		0 6 1 9		0 6 0 10		0 3 1 27		0 3 1 26		2 1 0 7	0 1 0 19
Yield of Milk, &c.	1	Cross short-horn	Aged	April 20	1,066		26 6	17 10	23 0	15 2	23 14	18 1	25 2	15 0	27 4	18 8	27 3	16 7	24 10	20 8	301 11	43 2
	2	Ayrshire – –	6	Mar. 15	874		23 2	16 1	23 0	14 5	22 3	14 0	26 6	14 15	21 3	14 7	21 8	14 1	20 14	14 0	260 1	37 2
	3	Cross short-horn	Aged	May 1	1,020		27 2	16 9	25 8	19 5	26 10	18 1	22 13	15 9	25 0	17 5	25 4	15 5	24 0	16 1	294 8	42 1
	4	Cross short-horn	Aged	April 15	1,185		25 3	18 14	26 0	17 1	25 10	16 14	24 10	15 7	24 8	16 3	26 0	14 11	20 4	14 0	283 5	40 8
	5	Half short-horn	4	Feb. 8	1,114		15 6	7 3	12 2	6 11	13 11	9 12	15 6	9 3	7 0	2 4	6 4	5 2	4 0	2 0	116 0	16 9
				Totals	5,259		117 3	74 5	112 10	72 8	112 0	76 12	114 5	70 2	104 15	68 11	106 3	65 10	93 12	66 9	1,255 9	—
				Means	1,052		23 7	14 14	22 8	14 8	22 6	15 6	22 14	14 0	21 0	13 12	21 4	13 2	18 12	13 5	251 2	35 14

* Three cows fed for putting.

† Unmeasured land, designated Plot 0 when unsewaged.

Detailed Record of Food consumed, and Milk yielded, by Cows fed on Unsewaged and Sewaged Meadow Grass, and on Italian Rye Grass (without Oilcake).
Third Season, 1863; 7 days.—May 12 to May 18.

Five Cows.*—Unsewaged Meadow Grass.

Grass consumed.	From which Field, Plot, and Crop		Tuesday. Rye, Plot 0†, Crop 1.	Wednesday. Rye, Plot 0†, Crop 1.	Thursday. Rye, Plot 0†, Crop 1.	Friday. Rye, Plot 0†, Crop 1.	Saturday. Rye, Plot 0†, Crop 1.	Sunday. Rye, Plot 0†, Crop 1.	Monday. Rye, Plot 0†, Crop 1.	Total in 7 days.	Per head per day.
	Quantities weighed (*tons. cwts. qrs. lbs.*)		0 7 0 0	0 6 3 8	0 5 2 0	0 8 1 0	0 6 2 0	0 3 2 11	0 3 2 10	2 1 1 1	0 1 0 20

Yield of Milk, &c.	Cows. Nos.	Breed.	Years old.	Dates of Calving.	Weights (April 27) lbs.	A.M. lbs.	A.M. qrs.	P.M. lbs.	P.M. qrs.	A.M. lbs.	A.M. qrs.	P.M. lbs.	P.M. qrs.	A.M. lbs.	A.M. qrs.	P.M. lbs.	P.M. qrs.	A.M. lbs.	A.M. qrs.	P.M. lbs.	P.M. qrs.	A.M. lbs.	A.M. qrs.	P.M. lbs.	P.M. qrs.	lbs.	qrs.
	1	Cross short-horn	Aged	Mar. 1	1,042	16	3	11	14	16	12	10	3	17	10	10	3	17	4	11	0	17	5	9	3	198	12	28	2
	2	Cross short-horn	6	Feb. 15	1,117	20	0	11	15	18	9	12	9	18	2	13	3	17	10	12	6	16	15	11	8	210	6	30	1
	3	Cross short-horn	3	April 13	746	16	0	10	14	17	8	11	0	17	12	10	15	17	15	11	7	16	10	10	12	17	4	10	12	196	13	28	2
	4	Cross short-horn	7	Feb. 17	1,089	10	1	8	5	11	10	7	13	11	10	9	8	12	6	8	12	13	4	9	5	12	11	7	6	13	11	7	4	143	10	20	8
	5	Cross short horn	7	April 17	1,058	20	0	13	5	22	1	13	10	21	8	13	10	22	12	14	6	22	4	13	6	21	0	13	2	22	14	12	6	246	4	35	3
				Totals	5,052	82	9	56	5	86	8	55	5	86	10	57	12	88	13	58	9	86	5	56	7	84	12	52	2	91	12	50	0	993	13	——	
				Means	1,010	16	8	11	4	17	5	11	1	17	5	11	9	17	12	11	11	17	4	11	5	16	15	10	7	18	6	10	0	198	12	28	6

Ten Cows.—Sewaged Meadow Grass.

Grass consumed.	From which Field, Plot, and Crop		Five-acre, Plot 3, Crop 1.	Five-acre, Plot 3, Crop 1.	Five-acre, Plot 3, Crop 1.	Ten-acre, Plot 4, Crop 1.	Ten-acre, Plot 4, Crop 1.	Ten-acre, Plot 3, Crop 1.	Ten-acre, Plot 3, Crop 1.		
	Quantities weighed (*tons. cwts. qrs. lbs.*)		0 19 1 12	0 11 2 19	0 14 2 6	0 16 1 6	0 13 2 14	0 7 1 13	0 7 1 19	4 10 1 5	0 1 1 5

Yield of Milk, &c.																												
	1	Cross short-horn	Aged	Mar. 10	1,064	19	15	15	6	22	4	14	6	20	0	14	7	20	2	15	15	19	8	15	8	19	8	13	8	19	2	13	2	242	11	34	11
	2	Cross short-horn	Aged	April 7	1,036	26	0	17	15	26	10	19	4	27	5	18	4	27	1	18	2	27	1	20	4	27	9	16	0	26	2	16	0	313	7	44	12
	3	Cross short-horn	6	Feb. 20	1,030	18	4	14	10	20	10	14	0	19	2	14	11	17	2	15	6	18	10	13	15	16	10	14	1	19	0	13	4	229	5	32	12
	4	Cross short-horn	7	Feb. 15	1,038	16	4	12	10	17	11	12	5	17	6	12	8	17	12	13	1	17	4	13	8	18	8	11	2	18	11	10	15	209	7	29	15
	5	Ayrshire – –	8	Feb. 22	1,002	15	0	11	2	16	14	10	8	17	9	12	0	16	14	12	3	16	2	12	5	16	8	11	1	17	0	9	6	194	8	27	12
	6	Cross short-horn	6	April 14	880	20	6	13	0	19	8	13	13	18	12	14	5	21	2	13	15	20	12	16	1	21	14	12	12	20	6	12	6	239	0	34	2
	7	Mongrel – –	Aged	April 12	808	16	6	9	15	16	1	11	6	20	2	12	5	18	13	12	5	19	3	12	5	19	6	10	12	17	6	10	1	206	6	29	8
	8	Cross short-horn	6	April 16	930	14	8	11	12	14	0	11	4	13	12	11	12	13	0	13	6	12	8	13	1	13	0	11	14	14	0	10	6	178	3	25	7
	9	Cross short-horn	7	April 13	906	18	0	15	8	20	6	14	1	20	5	13	14	20	12	15	12	20	5	15	3	19	0	14	12	20	9	12	1	240	8	34	6
	10	Half short horn	Aged	Oct. 30	1,320	13	12	9	11	12	8	9	12	13	1	10	14	13	12	11	2	13	0	10	8	13	4	8	12	14	0	8	9	162	9	23	4
				Totals	10,042	178	7	131	7	186	8	130	11	187	6	135	0	186	6	141	3	184	5	142	10	185	1	124	10	186	4	116	2	2,216	0	——	
				Means	1,004	17	14	13	2	18	11	13	1	18	12	13	8	18	10	14	2	18	7	14	4	18	8	12	7	18	10	11	10	221	10	31	11

Five Cows.—Unsewaged or Sewaged Italian Rye Grass.

Grass consumed.	From which Field, Plot, and Crop		Rye, Plot 0†, Crop 1.	Rye, Plot 0†, Crop 1.	Rye, Plot 0†, Crop 1.	Rye, Plot 0†, Crop 1.	Rye, Plot 0†, Crop 1.	Rye, Plot 0†, Crop 1.	Rye, Plot 0†, Crop 1.		
	Quantities weighed (*tons. cwts. qrs. lbs.*)		0 7 0 2	0 7 1 0	0 5 2 20	0 8 1 20	0 7 0 0	0 3 0 5	0 3 0 5	2 1 1 24	0 1 0 21

Yield of Milk, &c.																												
	1	Cross short-horn	Aged	April 20	1,066	28	1	17	6	27	2	19	1	28	0	19	8	27	5	21	7	26	12	19	14	26	8	17	8	27	1	16	6	321	15	46	0
	2	Ayrshire – –	6	Mar. 15	874	21	10	15	4	22	5	15	9	22	9	14	9	22	6	15	0	23	3	14	3	21	10	13	12	22	4	13	3	257	7	36	12
	3	Cross short-horn	Aged	May 1	1,020	25	8	15	10	25	6	17	10	25	11	16	8	24	6	17	9	25	4	17	8	25	14	16	14	25	9	16	4	295	9	42	4
	4	Cross short horn	Aged	April 15	1,185	16	12	10	14	20	0	13	1	20	7	12	4	22	1	13	9	22	0	16	9	22	2	10	7	18	12	11	11	230	9	32	15
	5	Half short-horn	4	Feb. 8	1,114	2	6	2	3	2	9	3	6	3	9	2	9	3	3	2	5	3	0	1	8	3	2	1	10	3	9	1	9	36	8	5	3
				Totals	5,259	94	5	61	5	97	6	68	11	100	4	65	6	99	5	69	14	100	3	69	10	99	4	60	3	97	3	59	1	1,142	0	——	
				Means	1,052	18	14	12	4	19	8	13	12	20	1	13	1	19	14	13	15	20	0	13	15	19	13	12	1	19	7	11	13	228	6	32	10

* Rye grass was given to these cows until the unsewaged meadow grass was ready for cutting.

† Unmeasured land, designated Plot 0 when unsewaged

Table X.—*continued.*

Detailed Record of Food consumed, and Milk yielded, by Cows fed on Unsewaged and Sewaged Meadow Grass, and on Italian Rye Grass (without Oilcake).
Third Season, 1863; 7 days.—May 19 to May 25.

					Tuesday.		Wednesday.		Thursday.		Friday.		Saturday.		Sunday.		Monday.		Total in 7 days.	Per head per day.
Five Cows.*—Unsewaged Meadow Grass.																				
Grass consumed.	From which Field, Plot, and Crop				Rye, Plot 0†, Crop 1.		Rye, Plot 0†, Crop 1.		Rye, Plot 0†, Crop 1.		§ Crop 1.		§ Crop 1.		§ Crop 1.		§ Crop 1.		—	—
	Quantities weighed (*tons. cwts. qrs. lbs.*)				0 6 2 0		0 5 2 0		‡0 5 1 0		0 6 1 0		0 8 0 7		0 3 3 14		0 3 3 14		1 19 1 7	0 1 0 14
	Cows. Nos.	Breed.	Years old.	Dates of Calving.	Weights (May 25) *lbs.*	A.M. *lbs.* *qrs.*	P.M. *lbs.* *qrs.*	A.M. *lbs.* *qrs.*	P.M. *lbs.* *qrs.*	A.M. *lbs.* *qrs.*	P.M. *lbs.* *qrs.*	A.M. *lbs.* *qrs.*	P.M. *lbs.* *qrs.*	A.M. *lbs.* *qrs.*	P.M. *lbs.* *qrs.*	A.M. *lbs.* *qrs.*	P.M. *lbs.* *qrs.*	*lbs.* *qrs.*	*lbs.* *qrs.*
Yield of Milk, &c.	1‖	Cross short-horn	Aged	May 1	1,064	16 1	10 12	17 0	10 15	17 4	10 12	17 5	9 6	16 14	9 1	17 8	9 12	186 11	26 11
	2	Cross short-horn	6	Feb. 15	1,184	17 9	10 15	15 1	9 13	17 7	11 2	16 11	12 6	17 6	12 5	18 1	10 12	198 6	28 5
	3	Cross short-horn	3	April 13	818	16 12	10 8	16 15	9 5	16 15	10 11	16 10	10 8	17 9	10 7	18 4	9 13	192 10	27 8
	4¶	Cross short-horn	8	May 20	1,096	12 11	7 2	11 14	8 8	10 3	8 10	11 7	9 15	10 1	6 13	17 13	10 8	134 12	19 4
	5	Cross short-horn	7	April 17	1,112	22 7	12 13	22 8	12 9	21 8	14 4	23 7	13 11	24 6	13 8	13 0	5 11	249 5	35 10
				Totals	5,274	85 8	51 14	84 2	49 2	83 5	55 7	85 8	55 14	84 9	53 7	87 9	47 13	87 7	50 3	961 12	—
				Means	1,055	17 2	10 6	16 13	9 13	16 10	11 1	17 2	11 3	16 15	10 11	17 8	9 9	17 8	10 1	192 6	27 8
Ten Cows.—Sewaged Meadow Grass.																				
Grass consumed.	From which Field, Plot, and Crop				Five-acre, Plot 3, Crop 1.		Five-acre, Plot 3, Crop 1.		Five-acre, Plot 3, Crop 1.		Ten-acre, Plot 3, Crop 1.		Ten-acre, Plot 3, Crop 1.		Ten-acre, Plot 3, Crop 1.		Ten-acre, Plot 3, Crop 1.		—	—
	Quantities weighed (*tons. cwts. qrs. lbs.*)				0 16 0 14		0 14 1 4		0 13 2 7		0 14 2 21		0 15 3 7		0 7 3 19		0 7 3 25		4 10 1 13	0 1 1 5
Yield of Milk, &c.	1	Cross short-horn	Aged	Mar. 10	1,136	17 12	14 2	20 4	14 14	18 6	14 3	18 10	13 3	16 10	12 7	19 6	12 10	19 10	13 5	225 6	32 3
	2	Cross short-horn	Aged	April 7	1,010	25 5	16 13	27 12	16 14	26 6	17 1	25 6	15 10	24 1	15 7	25 4	14 10	26 4	14 3	291 0	41 9
	3	Cross short-horn	6	Feb. 20	1,060	16 5	13 4	16 10	14 14	17 4	13 8	16 1	13 6	15 4	14 11	16 0	11 8	18 0	11 6	208 1	29 11
	4	Cross short-horn	7	Feb. 15	990	16 8	11 13	18 3	11 14	17 0	11 10	17 8	11 15	17 2	11 6	16 8	11 0	16 10	11 14	200 15	28 11
	5	Ayrshire – –	8	Feb. 22	884	13 12	9 13	17 0	9 6	15 6	10 9	15 2	10 2	14 6	9 15	15 8	10 0	14 6	9 10	174 15	25 0
	6	Cross short-horn	6	April 14	956	19 9	14 8	19 4	13 0	18 12	13 6	20 4	14 15	19 0	13 4	19 0	11 6	20 7	12 14	229 9	32 13
	7	Mongrel – –	Aged	April 12	838	16 14	11 4	18 6	11 4	18 1	12 2	18 7	11 0	16 8	10 14	17 1	10 6	18 8	10 0	200 11	28 11
	8	Cross short-horn	6	April 16	1,026	13 6	11 9	13 12	12 0	12 4	10 12	10 9	10 8	11 4	10 10	12 4	10 12	14 12	11 2	165 8	23 10
	9	Cross short-horn	7	April 13	954	20 12	13 8	19 14	13 4	20 5	14 8	20 9	12 2	18 9	12 0	18 2	14 12	20 10	12 5	231 4	33 1
	10	Half short-horn	Aged	Oct. 30	1,358	12 0	9 5	13 13	9 6	12 0	10 0	12 10	10 2	13 5	9 7	12 6	9 0	12 12	7 14	154 0	22 0
				Totals	10,312	172 3	125 15	184 14	126 12	175 12	127 11	175 2	122 15	166 1	120 1	171 7	116 0	181 15	114 9	2,081 5	—
				Means	1,031	17 4	12 9	18 8	12 11	17 9	12 12	17 8	12 5	16 10	12 0	17 2	11 10	18 3	11 7	208 2	29 12
Five Cows.—Unsewaged or Sewaged Italian Rye Grass.																				
Grass consumed.	From which Field, Plot, and Crop				Rye, Plot 0†, Crop 1.		Rye, Plot 0†, Crop 1.		§ Crop 1.		§ Crop 1.		§ Crop 1.		§ Crop 1.		§ Crop 1.		—	—
	Quantities weighed (*tons. cwts. qrs. lbs.*)				0 6 2 0		0 6 1 4		0 5 1 0		0 4 1 4		0 8 2 6		0 3 3 4		0 3 3 2		1 18 1 20	0 1 0 11
	1	Cross short-horn	Aged	April 20	1,122	26 4	17 10	25 9	18 10	28 2	19 0	28 0	19 12	28 15	19 0	31 4	16 12	29 7	17 15	326 4	46 10
	2	Ayrshire – –	6	Mar. 15	902	21 12	12 11	21 14	13 0	22 0	14 0	22 6	13 15	23 7	14 0	21 8	12 4	21 0	13 0	246 13	35 4
	3‖	Cross short-horn	Aged	Mar. 1	1,106	25 12	15 4	24 4	15 14	24 2	17 0	23 7	17 3	25 0	16 10	25 12	14 9	25 12	16 0	286 9	40 15
	4	Cross short-horn	Aged	April 15	1,176	20 8	13 13	22 14	14 12	21 14	14 10	20 8	13 10	22 4	14 5	24 8	13 11	25 13	14 10	257 14	36 13
	5**	Cross short-horn	6	Jan. 2	1,048	2 6	1 7	2 1	1 0	1 8	0 11	1 0	0 8	0 6	0 5	16 4	10 10	18 4	11 10	68 0	9 11
				Totals	5,354	96 10	60 15	96 10	63 4	97 10	65 5	95 5	65 0	100 0	64 4	119 4	67 14	120 4	73 3	1,183 8	—
				Means	1,071	19 5	12 3	19 5	12 10	19 9	13 1	19 1	13 0	20 0	12 14	23 14	13 9	24 1	14 10	237 2	33 14

* Rye grass was given to these cows until the unsewaged meadow grass was ready for cutting.
‡ Including 3 cwts. 1 qr. not experimental.
‖ At the date of this weighing, May 25, No. 1 cow on unsewaged meadow grass, and No. 3 cow on rye grass were transposed, and the description and weight entered are, in each case, those of the newly placed cow.
¶ The original No. 4 cow on unsewaged meadow grass increased from 1,089 lbs. on April 27 to 1,162 lbs. on May 25, and diminished considerably in yield of milk; and as she was obviously fattening she was replaced on May 25 by the cow whose description and weight are entered above.
† Unmeasured land, designated Plot 0 when unsewaged.
§ Not experimental.

Table X.—*continued.*

Detailed Record of Food consumed, and Milk yielded, by Cows fed on Unsewaged and Sewaged Meadow Grass, and on Italian Rye Grass (without Oilcake).
Third Season, 1863 ; 7 days.—May 26 to June 1.

					Tuesday.		Wednesday.		Thursday.		Friday.		Saturday.		Sunday.		Monday.		Total in 7 days.	Per head per day.
Five Cows.*—Unsewaged Meadow Grass.																				
Grass consumed.	From which Field, Plot, and Crop				† Rye, Crop 1.		† Rye, Crop 1.		† Rye, Crop 1.		† Rye, Crop 1.		† Rye, Crop 1.		† Rye, Crop 1.		† Rye, Crop 1.		——	——
	Quantities weighed (*tons. cwts qrs. lbs.*)				0 6 2 6		0 6 0 0		0 3 0 20		0 3 3 0		0 4 2 2		0 5 0 0		0 5 0 0		1 14 0 0	0 0 3 25
Yield of Milk, &c.	Cows. Nos.	Breed.	Years old.	Dates of Calving.	Weights (May 25). *lbs.*		A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	——	——
							lbs. qrs.	*lbs. qrs.*	*lbs. qrs.*	*lbs. qrs.*	*lbs. qrs.*	*lbs. qrs.*	*lbs. qrs.*	*lbs. qrs.*	*lbs. qrs.*	*lbs. qrs.*	*lbs. qrs.*	*lbs. qrs.*	*lbs. qrs.*	*lbs. qrs.*
	1	Cross short-horn	Aged	May 1	1,064		23 1	15 12	15 1	15 4	15 0	15 8	25 2	15 6	24 6	16 0	24 8	16 1	289 12	40 2
	2	Cross short-horn	6	Feb. 15	1,184		18 5	11 0	16 14	10 13	17 0	10 14	17 3	8 7	14 12	12 8	16 1	11 2	188 3	26 14
	3	Cross short-horn	3	April 13	818		16 3	11 4	16 14	10 15	17 5	10 0	16 12	10 5	17 2	10 8	25 12	15 8	184 3	26 5
	4	Cross short-horn	8	May 20	1,096		27 14	12 14	27 14	12 15	23 10	19 9	25 8	16 4	24 6	10 8	25 12	15 8	293 2	41 14
	5	Cross short-horn	7	April 17	1,112		21 2	14 4	20 14	17 10	22 0	11 15	20 0	12 6	22 3	13 6	21 6	13 8	244 3	34 14
				Totals	5,274		108 9	65 2	107 9	67 9	104 15	67 14	104 9	62 12	102 13	71 14	104 2	65 15	95 2	61 10	1,190 7	——
				Means	1,055		21 11	13 1	21 8	13 8	21 0	13 9	20 15	12 9	20 9	14 6	20 13	13 3	19 0	12 5	238 1	34 0
Ten Cows.—Sewaged Meadow Grass.																				
Grass consumed.	From which Field, Plot, and Crop				Five-acre, Plots2 & 3,Crop1.		Five-acre, Plot 2, Crop 1.		Five-acre, Plot 2, Crop 1.		Five-acre, Plot 2, Crop 1.		Five-acre, Plot 2, Crop 1.		Five-acre, Plot 2, Crop 1.		Five-acre, Plot 2, Crop 1.		——	——
	Quantities weighed (*tons. cwts. qrs. lbs.*)				1 2 3 7		0 16 0 0		0 11 1 23		0 10 2 5		0 10 1 12		0 12 1 11		0 12 1 17		4 15 3 19	0 1 1 13
Yield of Milk, &c.	1	Cross short-horn	Aged	Mar. 10	1,136		17 6	13 0	20 6	12 2	19 7	13 13	21 1	14 5	18 1	13 0	19 4	13 12	226 2	32 5
	2	Cross short-horn	Aged	April 7	1,010		23 8	15 5	23 12	14 15	25 12	15 9	25 6	15 12	25 3	14 8	25 4	14 4	271 3	38 12
	3	Cross short-horn	6	Feb. 20	1,060		17 8	12 1	17 0	12 6	16 6	13 6	17 2	12 7	14 0	11 1	15 8	13 6	206 13	28 11
	4	Cross short-horn	7	Feb. 15	990		14 9	11 12	16 10	12 7	17 12	12 4	17 12	13 4	17 11	13 6	16 4	12 5	206 13	28 15
	5	Ayrshire – –	8	Feb. 22	984		14 6	11 4	15 15	9 11	16 4	11 4	16 14	10 14	14 10	10 11	15 4	10 3	181 9	25 13
	6	Cross short-horn	6	April 14	956		19 8	12 1	21 2	12 12	21 4	14 9	23 8	14 2	22 1	12 5	20 6	13 7	237 10	33 15
	7	Mongrel – –	Aged	April 12	838		17 0	12 5	18 8	11 11	20 5	13 0	20 8	12 15	18 6	10 11	17 6	10 8	206 12	29 9
	8	Cross short-horn	6	April 16	1,026		11 0	16 3	11 5	15 6	12 2	15 4	11 6	17 1	13 10	18 14	14 0	10 4	193 13	27 11
	9	Cross short-horn	7	April 13	954		19 1	12 6	21 0	11 11	19 1	12 8	20 4	13 6	18 8	14 13	18 2	15 0	223 13	31 15
	10	Half short-horn	Aged	Oct. 30	1,358		12 3	8 10	12 8	8 11	12 2	9 10	13 0	8 11	11 10	8 11	13 1	8 8	141 8	20 3
				Totals	10,312		166 1	124 15	177 12	121 12	180 8	131 3	186 13	132 13	173 12	128 0	174 6	121 9	160 6	105 12	2,085 10	——
				Means	1,031		16 10	12 8	17 12	12 3	18 1	13 2	18 11	13 4	17 6	12 13	17 7	12 2	16 1	10 9	208 9	29 13
Five Cows.—Unsewaged or Sewaged Italian Rye Grass.																				
Grass consumed.	From which Field, Plot, and Crop				† Rye, Crop 1.		† Rye, Crop 1.		Rye, Plot 3, Crop 2.		Rye, Plot 3, Crop 2.		Rye, Plot 3, Crop 2.		Rye, Plot 3, Crop 2.		Rye, Plot 3, Crop 2.		——	——
	Quantities weighed (*tons. cwts. qrs. lbs.*)				0 8 1 6		0 7 2 10		0 7 1 15		0 2 3 17		0 7 3 12		0 6 1 23		0 6 2 0		2 6 3 27	0 1 1 10
Yield of Milk, &c.	1	Cross short-horn	Aged	April 20	1,122		28 2	18 0	28 8	17 3	29 10	17 9	29 1	17 7	29 2	20 12	29 15	17 13	327 7	46 10
	2	Ayrshire – –	6	Mar. 15	902		18 5	13 9	20 11	13 9	22 13	13 11	21 14	13 11	21 10	13 4	21 0	11 2	235 14	33 11
	3	Cross short-horn	Aged	Mar. 1	1,106		16 8	9 1	17 0	10 3	17 8	10 6	16 14	5 8	18 12	11 7	16 4	10 4	184 2	26 5
	4	Cross short-horn	Aged	April 15	1,176		24 5	15 13	24 5	16 14	23 14	15 0	24 0	16 1	25 0	16 4	22 8	12 8	270 7	38 10
	5	Cross short-horn	6	Jan. 2	1,048		19 2	15 10	16 8	10 0	16 8	9 12	16 5	10 4	15 6	12 0	16 6	9 0	190 11	27 4
				Totals	5,354		106 7	72 1	107 0	67 13	110 5	66 6	108 2	62 15	109 14	73 11	106 1	60 11	98 11	57 8	1,207 9	——
				Means	1,071		21 5	14 7	21 6	13 9	22 1	13 4	21 10	12 9	22 0	14 12	21 3	12 2	19 12	11 8	241 8	34 8

* Rye grass was given to these cows until the unsewaged meadow grass was ready for cutting.

† Not experimental.

Table X.—*continued.*

Detailed Record of Food consumed, and Milk yielded, by Cows fed on Unsewaged and Sewaged Meadow Grass, and on Italian Rye Grass (without Oilcake).
Third Season, 1863; 7 days.—June 2 to June 8.

					Tuesday.		Wednesday.		Thursday.		Friday.		Saturday.		Sunday.		Monday.		Total in 7 days.		Per head per day.	
Five Cows.*—Unsewaged Meadow Grass.																						
Grass consumed.	From which Field, Plot, and Crop				† Rye, Crop 1.		† Rye, Crop 1.		† Rye, Crop 1.		† Rye, Crop 1.		† Rye, Crop 1.		† Rye, Crop 1.		† Rye, Crop 1.		——		——	
	Quantities weighed (*tons. cwts. qrs. lbs.*)				0 5 3 14		0 4 2 2		0 9 3 14		0 4 2 0		0 4 0 0		0 5 2 4		0 5 2 4		1 19 3 10		0 1 0 15	
Yield of Milk, &c.	Cows. Nos.	Breed.	Years old.	Dates of Calving.	Weights (May 25) *lbs.*		A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	——		——	
							lbs. qrs.	*lbs. qrs.*	*lbs. qrs.*	*lbs. qrs.*	*lbs. qrs.*	*lbs. qrs.*	*lbs. qrs.*	*lbs. qrs.*	*lbs. qrs.*	*lbs. qrs.*	*lbs. qrs.*	*lbs. qrs.*	*lbs. qrs.*		*lbs. qrs.*	
	1	Cross short-horn	Aged	May 1	1,062‡		24 14	14 8	24 0	14 14	25 11	14 0	20 0	14 4	21 0	14 4	20 10	12 11	21 0	13 0	233 7		36 3	
	2	Cross short-horn	6	Feb. 15	1,177‡		14 13	10 8	16 0	9 8	15 4	9 0	14 3	10 18	15 1	9 12	16 3	9 5	16 0	9 0	174 14		25 0	
	3	Cross short-horn	3	April 13	821‡		14 6	9 10	16 15	9 7	15 2	10 0	14 10	9 13	15 2	8 15	14 10	9 0	14 14	9 0	171 3		24 7	
	4	Cross short-horn	8	May 20	1,094‡		24 12	17 11	25 3	17 12	26 4	18 0	27 4	16 12	27 0	19 1	25 2	18 4	26 1	16 8	306 5		43 12	
	5	Cross short-horn	7	April 17	1,110‡		20 0	12 1	20 10	12 8	20 7	12 14	20 0	13 10	20 7	11 12	20 3	11 2	19 12	12 6	227 12		32 9	
				Totals	5,264		98 13	63 15	103 6	64 1	100 12	63 14	96 1	64 15	98 10	63 12	96 12	60 6	98 6	59 14	1,133 9		——	
				Means	1,053		19 12	12 12	20 11	12 13	20 2	12 12	19 3	13 0	19 12	12 12	19 6	12 1	19 11	12 0	226 11		32 6	
Ten Cows.—Sewaged Meadow Grass.																						
Grass consumed.	From which Field, Plot, and Crop				Five-acre, Plot 2, Crop 1.		Five-acre, Plot 2, Crop 1.		Five-acre, Plot 2, Crop 1.		Ten-acre, Plot 3, Crop 1.		Ten-acre, Plot 3, Crop 1.		Ten-acre, Plot 2, Crop 1.		Ten-acre, Plot 2, Crop 1.		——		——	
	Quantities weighed (*tons. cwts. qrs. lbs.*)				0 11 2 2		0 9 1 13		0 17 0 9		0 12 1 25		0 5 2 7		0 14 3 8		0 14 3 13		4 5 2 21		0 1 0 25	
Yield of Milk, &c.	1	Cross short-horn	Aged	Mar. 10	1,136		17 2	13 9	17 10	12 11	17 12	12 6	17 12	13 11	18 0	13 10	18 7	12 6	16 8	10 15	212 7		30 6	
	2	Cross short-horn	Aged	April 7	1,010		21 3	13 8	22 4	13 14	21 11	14 2	22 1	14 8	23 1	14 2	22 0	12 4	20 10	13 0	248 4		35 7	
	3	Cross short-horn	8	Feb. 20	1,059		16 6	11 12	16 8	11 14	16 3	11 15	15 7	12 0	15 7	12 15	16 1	11 6	16 0	11 14	196 11		28 2	
	4	Cross short-horn	7	Feb. 15	930		16 0	10 11	14 15	10 14	15 10	10 11	16 4	11 2	16 10	11 0	16 2	9 7	15 0	9 8	183 14		26 4	
	5	Ayrshire – –	8	Feb. 22	984		13 11	10 10	14 7	10 8	15 3	10 5	14 8	11 7	16 2	9 8	15 2	10 7	13 4	8 12	173 14		24 13	
	6	Cross short-horn	6	April 14	956		19 11	12 10	20 4	12 6	19 0	13 12	20 10	13 7	21 6	13 0	21 0	11 2	18 2	11 8	227 14		32 9	
	7	Mongrel – –	Aged	April 12	868		17 4	10 15	17 3	10 12	17 13	11 6	18 0	12 3	20 12	12 3	19 2	11 0	16 0	9 14	204 7		29 3	
	8	Cross short-horn	6	April 16	1,026		12 11	15 11	13 5	16 1	13 0	15 10	10 13	16 2	10 8	14 14	10 4	10 1	10 7	10 2	179 9		25 11	
	9	Cross short-horn	7	April 13	954		18 0	12 10	18 5	14 10	17 4	15 0	18 12	13 9	17 12	13 12	18 1	11 8	20 0	10 9	219 12		31 6	
	10§	Half short-horn	Aged	Oct. 30	1,358		9 3	5 10	10 6	6 14	10 11	6 8	11 2	6 13	10 12	7 0	9 2	1 10	8 6	4 1	108 2		15 7	
				Totals	10,312		161 3	117 10	165 3	120 8	164 3	121 11	165 4	124 14	170 6	122 0	165 5	101 3	154 5	100 3	1,954 14		——	
				Means	1,031		16 2	11 12	16 8	12 1	16 7	12 3	16 10	12 8	17 1	12 3	16 8	10 2	15 7	10 0	195 8		27 15	
Five Cows.—Unsewaged or Sewaged Italian Rye Grass.																						
Grass consumed.	From which Field, Plot, and Crop				Rye, Plot 3, Crop 2.		Rye, Plot 3, Crop 2.		Rye, Plot 3, Crop 2.		Rye, Plot 3, Crop 2.		Rye, Plot 3, Crop 2.		Rye, Plot 3, Crop 2.		Rye, Plot 3, Crop 2.		——		——	
	Quantities weighed (*tons. cwts. qrs. lbs.*)				0 7 1 23		0 7 1 9		0 7 2 7		0 11 0 23		0 4 3 25		0 6 3 26		0 6 3 25		2 12 1 26		0 1 2 0	
Yield of Milk, &c.	1	Cross short-horn	Aged	April 20	1,122		28 6	18 8	28 10	21 0	28 4	17 0	28 6	20 12	28 0	18 10	27 3	18 4	26 10	16 0	325 9		46 8	
	2	Ayrshire – –	6	Mar. 15	902		19 9	11 6	19 11	12 0	20 0	13 0	20 1	13 2	19 13	11 15	19 5	9 13	19 0	11 9	220 4		31 7	
	3	Cross short-horn	Aged	Mar. 1	1,105		15 12	10 1	16 11	10 6	17 0	11 0	16 9	10 11	17 0	9 10	17 0	10 5	17 0	9 13	188 14		27 0	
	4	Cross short-horn	Aged	April 15	1,176		23 10	13 15	25 1	14 12	22 12	15 9	23 8	14 10	22 0	12 12	22 0	13 10	22 2	15 2	261 7		37 6	
	5	Cross short-horn	6	Jan. 2	1,048		14 6	9 12	15 5	9 2	14 0	11 7	14 2	10 3	14 7	8 10	13 4	7 12	15 0	7 10	165 0		23 9	
				Totals	5,354		101 11	63 10	105 6	67 4	102 0	68 0	102 10	69 6	101 4	61 9	98 12	59 12	99 12	60 2	1,161 2		——	
				Means	1,071		20 5	12 12	21 1	13 7	20 6	13 10	20 9	13 14	20 2	12 5	19 12	11 15	19 15	12 1	232 4		33 3	

* Rye grass was given to these cows until the unsewaged meadow grass was ready for cutting.
‡ These weights were taken on June 8 preparatory to commencing the unsewaged meadow grass.
† Not experimental.
§ This cow was unwell, as her yield of milk indicates.

Detailed Record of Food consumed, and Milk yielded, by Cows fed on Unsewaged and Sewaged Meadow Grass, and on Italian Rye Grass (without Oilcake).
Third Season, 1863; 7 days.—June 9 to June 15.

					Tuesday.		Wednesday.		Thursday.		Friday.		Saturday.		Sunday.		Monday.		Total in 7 days.	Per head per day.
Five Cows.—Unsewaged Meadow Grass.																				
Grass consumed.	From which Field, Plot, and Crop				Ten-acre, Plot 0*, Crop 1.		Ten-acre, Plot 0*, Crop 1.		Ten-acre, Plot 0*, Crop 1.		Ten-acre, Plot 0*, Crop 1.		Ten-acre, Plot 0*, Crop 1.		Ten-acre, Plot 0*, Crop 1.		Ten-acre, Plot 0*, Crop 1.		—	—
	Quantities weighed (*tons. cwts. qrs. lbs.*)				0 9 3 4		0 6 0 5		0 9 3 17		0 8 2 2		0 5 0 10		0 5 1 7		0 5 1 7		2 9 3 24	0 1 1 20
	Cows. Nos.	Breed.	Years old.	Dates of Calving.	Weights (May 25) *lbs.*		A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	—	—
							lbs. qrs.	*lbs. qrs.*	*lbs. qrs.*	*lbs. qrs.*	*lbs. qrs.*	*lbs. qrs.*	*lbs. qrs.*	*lbs. qrs.*	*lbs. qrs.*	*lbs. qrs.*	*lbs. qrs.*	*lbs. qrs.*	*lbs. qrs.*	*lbs. qrs.*
Yield of Milk, &c.	1	Cross short-horn	Aged	May 1	1,082†		19 12	10 11	22 0	14 1	20 1	12 4	19 0	13 12	19 6	13 7	19 9	12 4	12 3	229 14	32 14
	2	Cross short-horn	6	Feb. 15	1,177†		13 0	10 2	15 2	9 5	14 0	9 8	13 4	9 5	14 6	9 11	13 0	9 6	13 13	9 0	162 14	23 4
	3	Cross short-horn	8	April 13	821†		14 6	9 4	14 13	9 10	14 8	8 9	13 8	8 6	13 8	8 12	13 11	8 7	14 6	8 9	160 5	22 14
	4	Cross short-horn	8	May 20	1,064†		24 8	19 1	26 3	17 6	25 4	17 9	22 0	16 15	23 12	17 0	23 4	16 4	15 6	285 12	40 13
	5	Cross short-horn	7	April 17	1,110†		19 8	12 4	29 0	12 6	20 4	12 1	19 7	12 0	19 12	12 0	20 6	11 10	20 1	11 8	223 3	31 14
				Totals	5,264		91 2	64 6	97 8	62 12	92 1	59 15	87 3	60 6	90 12	60 14	89 14	57 15	90 10	56 10	1,062 0	—
				Means	1,053		18 4	12 14	19 5	12 9	18 6	12 0	17 7	12 1	18 2	12 3	18 0	11 9	18 2	11 5	212 6	30 5
Ten Cows.—Sewaged Meadow Grass.																				
Grass consumed.	From which Field. Plot, and Crop				Ten-acre, Plot 2, Crop 1.		Ten-acre, Plot 2, Crop 1.		Ten-acre, Plot 2, Crop 1.		Ten-acre, Plot 2, Crop 1.		Ten-acre, Plot 2, Crop 1.		Ten-acre, Plot 2, Crop 1.		Ten-acre, Plot 2, Crop 1.		—	—
	Quantities weighed (*tons. cwts. qrs. lbs.*)				0 11 0 21		0 12 3 21		0 11 3 1		0 12 2 0		0 13 3 25		0 9 3 17		0 9 3 19		4 2 0 20	0 1 0 20
	1	Cross short-horn	Aged	Mar. 10	1,126		17 3	12 8	16 7	11 10	15 10	10 9	14 10	9 7	15 0	10 0	14 14	10 1	14 10	10 4	182 13	26 2
	2	Cross short-horn	Aged	April 7	1,040		21 0	14 0	21 10	12 14	20 2	13 2	19 0	13 6	18 0	12 10	18 2	11 0	18 12	11 6	225 0	32 2
	3	Cross short-horn	6	Feb. 20	1,050		16 8	10 3	15 13	12 6	15 12	10 8	14 12	12 4	14 2	11 12	14 0	11 8	14 6	9 11	183 9	26 4
	4	Cross short-horn	7	Feb. 15	960		14 1	10 4	15 0	9 12	14 2	10 0	15 10	10 8	14 14	10 6	15 0	9 12	15 0	9 8	174 6	24 14
	5	Ayrshire – –	8	Feb. 22	984		14 0	9 11	13 2	10 8	14 4	10 0	12 12	9 7	13 0	10 10	13 6	9 3	14 4	8 14	164 1	23 7
Yield of Milk, &c.	6	Cross short-horn	5	April 14	956		18 3	12 11	19 0	11 7	18 0	12 2	17 13	12 8	19 1	11 0	17 8	11 7	18 0	11 4	210 0	30 0
	7	Mongrel – –	Aged	April 12	898		16 0	11 4	17 1	10 9	16 8	10 4	17 0	10 2	15 6	11 2	16 0	9 4	15 3	9 1	184 12	26 6
	8	Cross short-horn	6	April 16	1,026		10 2	14 5	10 6	13 14	11 12	13 2	9 11	12 9	9 4	12 4	10 12	10 0	11 8	10 14	160 7	22 15
	9	Cross short-horn	7	April 13	954		16 7	14 3	19 4	12 2	17 2	13 10	16 12	12 6	17 4	11 10	17 10	11 2	18 0	11 8	209 0	29 14
	10	Half short-horn	Aged	Oct. 30	1,338		6 4	5 0	6 6	5 12	7 0	5 10	7 6	6 2	8 12	5 15	8 10	6 0	8 1	6 1	92 15	13 4
				Totals	10,312		149 12	114 1	154 1	110 14	150 4	109 8	146 6	108 11	144 11	107 5	145 14	99 5	147 12	98 7	1,786 15	—
				Means	1,031		15 0	11 6	15 7	11 1	15 0	10 15	14 10	10 14	14 8	10 12	14 9	9 15	14 12	9 14	178 11	25 8
Five Cows.—Unsewaged or Sewaged Italian Rye Grass.																				
Grass consumed.	From which Field, Plot, and Crop				Rye. Plot 3, Crop 2.		Rye. Plot 3, Crop 2.		Rye. Plot 3, Crop 2.		Rye. Plots2 &3, Crop 2.		Rye, Plot 2, Crop 2.		Rye, Plot 2, Crop 2.		Rye, Plot 2, Crop 2.		—	—
	Quantities weighed (*tons. cwts. qrs. lbs.*)				0 9 3 23		0 6 0 15		0 6 3 3		0 11 0 10		0 7 2 19		0 8 1 25		0 8 1 26		2 18 2 9	0 1 2 19
	1	Cross short-horn	Aged	April 20	1,122		26 10	18 1	27 1	15 5	26 0	18 5	25 4	16 14	26 0	16 3	23 0	14 5	295 12	42 4
	2	Ayrshire – –	6	Mar. 15	902		19 0	13 3	20 3	13 3	19 14	12 1	18 11	11 0	17 12	13 4	19 10	11 0	19 6	10 9	218 12	31 4
	3	Cross short-horn	Aged	Mar. 1	1,106		17 0	10 11	16 15	9 6	14 4	10 11	15 3	10 2	15 8	9 11	15 4	9 3	15 0	9 5	177 11	25 6
	4	Cross short-horn	Aged	April 15	1,176		22 2	16 3	22 8	15 0	23 15	14 12	22 0	12 10	22 5	14 14	21 12	13 2	23 3	13 5	257 11	36 13
	5	Cross short-horn	6	Jan. 2	1,048		13 1	9 8	14 10	8 12	13 2	9 14	12 14	8 14	12 13	8 12	13 6	8 12	14 8	7 14	156 12	22 6
				Totals	5,354		97 13	67 10	101 5	61 10	97 3	65 11	93 13	59 8	94 1	63 5	96 0	58 4	95 1	55 6	1,106 10	—
				Means	1,071		19 9	13 8	20 4	12 5	19 7	13 2	18 12	11 15	18 13	12 11	19 3	11 11	19 0	11 1	221 5	31 10

* Unmeasured land, designated Plot 0 when unsewaged.

† These weights were taken on June 8, preparatory to commencing the unsewaged meadow grass.

Table X.—*continued.*

Detailed Record of Food consumed, and Milk yielded, by Cows fed on Unsewaged and Sewaged Meadow Grass, and on Italian Rye Grass (without Oilcake). Third Season, 1863 ; 7 days.—June 16 to June 22.

Five Cows.—Unsewaged Meadow Grass.

Grass consumed.	From which Field, Plot, and Crop					Tuesday. Five-acre, Plot 0,* Crop 1.		Wednesday. Five-acre, Plot 0,* Crop 1.		Thursday. Five-acre, Plot 0,* Crop 1.		—		Saturday. Five acre, Plot 0,* Crop 1.		Sunday. Five-acre, Plot 0,* Crop 1.		Monday. Five-acre, Plot 0*, Crop 1.		Total in 7 days. —	Per head per day. —
	Quantities weighed (*tons. cwts. qrs. lbs.*)					0 5 3 17½		0 6 3 0½		0 7 2 8½		—		0 3 0 22½		0 6 0 0½		0 5 3 27		1 15 1 20½	0 1 0 1
Yield of Milk, &c.	Cows. Nos.	Breed.	Years old.	Dates of Calving.	Weights (June 22). *lbs.*	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	—	—
						lbs. qrs.	*lbs. qrs.*	*lbs. qrs.*	*lbs. qrs.*	*lbs. qrs.*	*lbs. qrs.*	*lbs. qrs.*	*lbs. qrs.*	*lbs. qrs.*	*lbs. qrs.*	*lbs. qrs.*	*lbs. qrs.*	*lbs. qrs.*	*lbs. qrs.*	*lbs. qrs.*	*lbs. qrs.*
	1	Cross short-horn	Aged	May 1	1,078	19 7	12 4	20 3	12 15	20 4	12 11	21 4	12 10	20 8	12 14	20 0	12 10	20 4	12 6	230 4	32 14
	2	Cross short-horn	6	Feb. 15	1,190	13 5	10 3	13 0	10 4	12 14	10 0	13 11	10 0	13 7	10 1	13 8	6 15	13 3	9 7	159 14	22 13
	3	Cross short-horn	3	April 13	804	15 12	8 4	14 0	8 10	14 7	8 13	14 7	8 8	12 4	8 12	14 1	8 0	14 2	8 4	156 4	22 5
	4	Cross short-horn	8	May 20	1,069	22 2	16 10	22 1	16 12	23 0	16 12	23 4	17 6	22 4	16 11	22 15	16 2	22 6	15 8	273 13	39 2
	5	Cross short-horn	7	April 17	1,097	19 7	10 9	20 14	11 4	19 8	11 12	19 11	11 2	18 8	12 2	19 4	10 0	20 8	10 11	215 4	30 12
				Totals	5,238	88 1	57 14	90 2	59 13	90 1	60 0	92 5	59 10	86 15	60 8	89 12	53 11	90 7	56 4	1,035 7	—
				Means	1,048	17 10	11 9	18 0	11 15	18 0	12 0	18 7	11 15	17 6	12 2	17 15	10 12	18 1	11 4	207 1	29 9

Ten Cows.—Sewaged Meadow Grass.

Grass consumed.	From which Field, Plot, and Crop					Five-acre, Plot 2, Crop 1.		Five-acre, Plot 2, Crop 1.		Five-acre, Plot 2, Crop 1.		Ten-acre, Plot 2, Crop 1.		Ten-acre, Plot 4, Crop 2.		Five-acre, Plot 4, Crop 2.		Five-acre, Plot 4, Crop 2.		—	—
	Quantities weighed (*tons. cwts. qrs. lbs.*)					0 12 3 17		0 5 1 8		0 7 2 10		0 12 1 6		0 15 1 25		0 9 1 27		0 9 2 6		3 12 1	0 1 0 4
Yield of Milk, &c.	1	Cross short-horn	Aged	Mar. 10	1,121	13 4	10 3	15 0	11 4	14 14	11 7	14 7	11 11	14 5	11 14	14 4	10 10	14 6	9 8	177 1	25 5
	2†	Cross short-horn	8	June 15	1,280	17 0	10 13	18 13	13 0	18 9	12 11	19 5	12 7	18 10	13 8	19 0	10 0	16 4	9 0	209 0	29 14
	3	Cross short-horn	6	Feb. 20	1,066	13 1	11 0	13 2	12 0	13 3	12 2	13 7	10 7	13 2	11 0	13 8	9 4	13 5	8 6	166 15	23 13
	4	Cross short-horn	7	Feb. 15	996	13 6	9 6	14 0	10 0	14 2	10 0	14 1	10 0	13 10	10 2	14 7	8 8	14 4	8 0	163 14	23 7
	5	Ayrshire – –	8	Feb. 22	1,000	14 8	9 10	14 1	9 12	14 8	9 14	14 10	10 1	13 11	9 5	13 12	8 0	13 0	8 1	162 13	23 4
	6	Cross short-horn	6	April 14	958	17 0	11 0	16 12	12 1	17 0	12 15	16 11	11 4	16 7	11 3	16 0	10 4	15 0	10 6	193 15	27 11
	7	Mongrel – –	Aged	April 12	894	15 4	9 6	15 2	9 9	14 8	9 10	15 4	10 3	14 10	9 8	14 6	7 6	12 0	7 6	164 2	23 7
	8	Cross short-horn	6	April 16	1,068	10 6	12 6	11 3	12 3	9 0	12 15	10 0	9 12	12 0	11 15	11 11	8 6	11 4	8 2	151 3	21 10
	9	Cross short-horn	7	April 13	904	17 1	10 15	17 14	10 13	17 11	12 8	18 0	11 2	17 6	12 14	16 0	9 4	16 12	11 10	199 14	28 9
	10‡	Half short-horn	8	April 25	1,186	8 4	6 0	8 4	6 13	8 12	6 4	8 10	7 0	8 2	6 8	8 9	6 0	8 4	6 1	103 7	14 12
				Totals	10,533	130 2	100 11	144 3	107 7	142 3	110 6	144 7	103 15	141 15	107 13	141 9	87 10	134 7	86 8	1,692 4	—
				Means	1,053	13 15	10 1	14 7	10 12	14 3	11 1	14 7	10 6	14 3	10 13	14 3	8 12	13 7	8 10	169 4	24 3

Five Cows.—Unsewaged or Sewaged Italian Rye Grass.

Grass consumed.	From which Field, Plot, and Crop					Rye, Plot 2, Crop 2.		Rye, Plot 2, Crop 2.		Rye, Plot 2, Crop 2.		Rye, Plot 2, Crop 2.		Rye, Plot 2, Crop 2.		Rye, Plot 2, Crop 2.		Rye, Plot 2, Crop 2.		—	—
	Quantities weighed (*tons. cwts. qrs. lbs.*)					0 6 2 26		0 12 0 19		0 6 0 23		0 6 1 15		0 8 1 15		0 7 1 9		0 7 1 14		2 14 2 9	0 1 2 7
Yield of Milk, &c.	1	Cross short-horn	Aged	April 20	1,122	22 8	14 6	25 6	17 14	27 0	16 2	26 3	16 10	23 14	17 0	22 10	14 2	21 6	14 11	279 12	39 15
	2	Ayrshire – –	6	Mar. 15	878	17 11	11 6	18 10	11 9	19 1	11 14	19 13	11 10	18 10	11 2	17 11	9 4	17 0	9 14	205 3	29 5
	3	Cross short-horn	Aged	Mar. 1	1,087	14 5	10 0	15 4	10 9	14 13	9 11	15 4	10 3	14 12	9 5	14 15	8 5	15 8	8 6	171 6	24 8
	4	Cross short-horn	Aged	April 15	1,180	19 5	13 12	20 13	13 3	21 8	12 2	21 2	13 10	20 0	12 14	20 2	12 14	20 0	12 7	233 12	33 6
	5	Cross short-horn	6	Jan. 2	1,128	14 2	8 6	13 6	10 3	12 10	8 15	13 8	10 3	12 1	8 6	12 3	8 2	12 8	8 0	152 9	21 13
				Totals	5,395	87 15	57 14	93 4	63 9	95 2	58 12	93 14	62 4	89 5	58 11	87 9	52 11	86 6	53 6	1,042 10	—
				Means	1,079	17 9	11 9	18 11	12 11	19 0	11 12	19 3	12 7	17 14	11 12	17 8	10 9	17 4	10 11	208 8	29 13

* Unmeasured land, designated Plot 0 when unsewaged.
† The original No. 2 cow on sewaged meadow grass falling ill, was replaced by another on June 24, whose description, and weight on June 22, are entered in the Table.
‡ The original No. 10 cow having fallen off considerably in yield of milk, and slipping her calf about this time, was replaced by another on June 22, whose description and weight are given in the Table.

Detailed Record of Food consumed, and Milk yielded, by Cows fed on Unsewaged and Sewaged Meadow Grass, and on Italian Rye Grass (without Oilcake).
Third Season, 1863 ; 7 days.—June 23 to June 29.

Five Cows.—Unsewaged Meadow Grass.

Grass consumed.	From which Field, Plot, and Crop					Ten acre, Plot 0*, Crop 1.		Five-acre, Plot 0*, Crop 1.		Ten-acre, Plot 1, Crop 1.		Ten-acre, Plot 1, Crop 1.		Ten-acre, Plot 1, Crop 1.		Ten-acre, Plot 1, Crop 1.		Ten-acre, Plot 1, Crop 1.		Ten-acre, Plot 1, Crop 1.		——	——
	Quantities weighed (*tons. cwts. qrs. lbs.*)					†0 12 2 22		0 4 0 4		0 2 3 23½		0 4 0 1½		0 4 2 7½		0 2 1 22½		0 2 1 26		1 13 0 23		0 0 3 22	
Yield of Milk, &c.	Cows. Nos.	Breed.	Years old.	Dates of Calving.	Weights (June 22) *lbs.*	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	——	——	——	——
						lbs. *qrs.*	*lbs.* *qrs.*	*lbs.* *qrs.*	*lbs.* *qrs.*	*lbs.* *qrs.*	*lbs.* *qrs.*	*lbs.* *qrs.*	*lbs.* *qrs.*	*lbs.* *qrs.*	*lbs.* *qrs.*	*lbs.* *qrs.*	*lbs.* *qrs.*	*lbs.* *qrs.*	*lbs.* *qrs.*	*lbs.* *qrs.*		*lbs.* *qrs.*	
	1	Cross short-horn	Aged	May 1	1,078	19 1	12 10	19 0	12 6	19 3	12 0	18 1	11 4	18 1	12 8	19 4	11 0	18 10	10 13	213 13		30 9	
	2	Cross short-horn	6	Feb. 15	1,190	12 2	9 12	13 3	9 5	13 5	9 1	12 12	9 3	13 0	8 1	12 10	7 12	12 8	8 0	150 10		21 8	
	3	Cross short-horn	3	April 13	804	13 2	8 9	13 8	8 12	13 4	8 2	12 10	8 0	12 0	7 11	12 8	7 3	12 8	7 6	145 3		20 12	
	4	Cross short-horn	8	May 20	1,069	21 6	14 14	22 14	15 6	23 0	16 3	21 4	16 14	20 8	15 9	22 0	13 0	23 0	14 12	260 10		37 4	
	5	Cross short-horn	7	April 17	1,097	18 3	11 14	18 10	11 0	18 0	11 12	18 2	11 0	18 6	11 7	18 12	10 1	19 6	10 10	207 3		29 9	
				Totals	5,238	83 14	57 11	87 3	56 13	86 12	57 2	82 13	56 5	81 15	55 4	85 2	49 0	86 0	51 9	977 7		——	
				Means	1,048	16 12	11 9	17 7	11 6	17 6	11 7	16 9	11 4	16 6	11 1	17 0	9 13	17 3	10 5	195 8		27 15	

Ten Cows.—Sewaged Meadow Grass.

Grass consumed.	From which Field, Plot, and Crop					Five-acre, Plot 4, Crop 2.		Five-acre, Plot 3, Crop 2.		Five-acre, Plot 3, Crop 2.		Ten-acre, Plot 3, Crop 2.		Ten-acre, Plot 3, Crop 2.		Ten-acre, Plot 3, Crop 2.		Ten-acre, Plot 3, Crop 2.		——	——
	Quantities weighed (*tons. cwts. qrs. lbs.*)					0 13 2 1		0 14 3 19		0 13 1 18		0 11 2 10		0 9 0 25		0 12 1 22		0 12 1 27		4 7 2 10		0 1 1 0	
Yield of Milk, &c.						A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	——	——	——	——
						lbs. *qrs.*	*lbs.* *qrs.*	*lbs.* *qrs.*	*lbs.* *qrs.*	*lbs.* *qrs.*	*lbs.* *qrs.*	*lbs.* *qrs.*	*lbs.* *qrs.*	*lbs.* *qrs.*	*lbs.* *qrs.*	*lbs.* *qrs.*	*lbs.* *qrs.*	*lbs.* *qrs.*	*lbs.* *qrs.*	*lbs.* *qrs.*		*lbs.* *qrs.*	
	1	Cross short-horn	Aged	Mar. 10	1,121	13 4	10 4	15 4	10 8	16 1	10 3	14 0	11 14	14 14	12 0	16 4	11 8	16 12	10 14	183 10		26 4	
	2	Cross short-horn	8	June 15	1,280	13 8	9 10	18 5	13 11	18 6	13 14	18 5	13 11	21 0	16 8	22 6	14 2	23 8	15 4	232 2		33 3	
	3	Cross short-horn	6	Feb. 20	1,066	13 0	9 11	14 2	10 4	14 3	10 0	15 6	10 6	12 8	12 3	14 2	10 3	14 14	11 11	172 9		24 10	
	4	Cross short-horn	7	Feb. 15	996	12 2	8 1	13 6	9 0	13 4	7 13	12 7	8 10	12 0	8 12	14 3	8 6	14 6	9 3	151 9		21 10	
	5	Ayrshire - -	8	Feb. 22	1,000	12 3	8 3	13 2	10 3	13 7	9 6	12 12	9 6	13 0	10 0	13 8	8 10	15 7	8 8	157 11		22 8	
	6	Cross short-horn	6	April 14	958	15 8	11 10	17 6	10 7	18 4	10 0	17 12	10 6	18 4	11 13	18 7	9 9	16 14	11 6	197 10		28 4	
	7	Mongrel - -	Aged	April 12	894	12 3	8 0	13 1	8 7	13 0	8 1	12 8	8 4	12 14	8 14	13 10	7 7	13 8	8 1	147 14		21 2	
	8	Cross short-horn	6	April 16	1,068	10 2	11 14	10 7	11 12	10 7	8 5	10 11	8 12	11 10	8 12	10 8	9 8	11 14	8 14	143 8		20 8	
	9	Cross short-horn	7	April 13	964	15 0	11 9	15 0	10 8	15 0	10 13	14 0	9 3	16 2	10 0	17 9	11 14	13 5	10 11	182 10		26 2	
	10	Half short-horn	8	April 25	1,186	23 3	16 0	22 9	14 2	22 6	15 0	19 0	16 2	21 0	18 1	23 8	13 4	23 12	14 2	262 1		37 7	
				Totals	10,533	140 1	104 14	152 10	108 14	154 6	103 7	146 13	106 10	153 4	116 15	164 1	104 7	166 4	108 10	1,831 4		——	
				Means	1,053	14 0	10 8	15 4	10 14	15 7	10 5	14 11	10 11	15 5	11 11	16 7	10 7	16 10	10 14	183 2		26 3	

Five Cows.—Unsewaged or Sewaged Italian Rye Grass.

Grass consumed.	From which Field, Plot, and Crop					Rye, Plot 2, Crop 2.		Rye, Plot 2, Crop 2.		Rye, Plot 2, Crop 2, & Plot 3, Crop 3.		Rye, Plot 3, Crop 3.		Rye, Plot 3, Crop 3.		Rye, Plot 3, Crop 3.		Rye, Plot 3, Crop 3.		——	——
	Quantities weighed (*tons. cwts. qrs. lbs.*)					0 6 1 0		0 8 2 2		0 6 2 25		0 5 0 10		0 9 0 23		0 5 3 2		0 5 3 7		2 7 1 13		0 1 1 12	
Yield of Milk, &c.						A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	——	——	——	——
						lbs. *qrs.*	*lbs.* *qrs.*	*lbs.* *qrs.*	*lbs.* *qrs.*	*lbs.* *qrs.*	*lbs.* *qrs.*	*lbs.* *qrs.*	*lbs.* *qrs.*	*lbs.* *qrs.*	*lbs.* *qrs.*	*lbs.* *qrs.*	*lbs.* *qrs.*	*lbs.* *qrs.*	*lbs.* *qrs.*	*lbs.* *qrs.*		*lbs.* *qrs.*	
	1	Cross short-horn	Aged	April 20	1,122	21 6	15 0	23 12	14 5	22 0	14 6	22 0	14 10	20 0	13 7	20 8	13 6	23 9	12 12	251 1		35 14	
	2	Ayrshire - -	6	Mar. 15	878	16 4	10 5	17 3	10 10	17 0	11 4	16 0	10 12	17 10	10 0	16 12	9 4	17 2	10 11	190 13		27 4	
	3	Cross short-horn	Aged	Mar. 1	1,087	14 8	10 0	14 15	9 10	15 3	9 1	15 1	10 2	15 0	9 8	14 6	8 9	15 10	7 15	169 8		24 3	
	4	Cross short-horn	Aged	April 15	1,189	20 0	13 0	19 11	12 0	19 8	13 10	20 4	13 0	18 14	12 4	18 13	12 7	20 0	11 7	224 14		32 2	
	5	Cross short horn	6	Jan. 2	1,128	12 1	8 12	11 4	8 6	11 12	8 0	12 4	8 1	11 12	6 13	12 0	8 0	12 7	7 2	138 10		19 13	
				Totals	5,395	84 3	57 1	86 13	54 15	85 7	56 5	85 9	56 9	83 4	52 0	82 7	51 10	88 12	49 15	974 14		——	
				Means	1,079	16 13	11 7	17 6	11 0	17 2	11 4	17 2	11 5	16 10	10 6	16 8	10 5	17 12	10 0	195 0		27 14	

* Unmeasured land, designated Plot 0 when unsewaged.

† Including about 3 cwts. off Five-acre, Plot 0, Crop 1.

Table X.—*continued.*

Detailed Record of Food consumed, and Milk yielded, by Cows fed on Unsewaged and Sewaged Meadow Grass, and on Italian Rye Grass (without Oilcake).
Third Season, 1863; 7 days.—June 30 to July 6.

Five Cows.—Unsewaged Meadow Grass.

					Tuesday.		Wednesday.		Thursday.		Friday.		Saturday.		Sunday.		Monday.		Total in 7 days.	Per head per day.
Grass consumed.	From which Field, Plot, and Crop				Ten-acre, Plot 1, Crop 1.		Ten-acre, Plot 1, Crop 1.		Ten-acre, Plot 1, Crop 1.		Ten-acre, Plot 1, Crop 1.		Ten-acre, Plot 1, Crop 1.		Ten-acre, Plot 1, Crop 1.		Ten-acre, Plot 1, Crop 1.			
	Quantities weighed (*tons. cwts. qrs. lbs.*)				0 4 3 6½		0 2 2 21½		0 4 1 25½		0 6 0 10		0 5 3 10½		0 4 1 13½		0 4 0 1		1 12 1 4½	0 0 3 19
	Cows. Nos.	Breed.	Years old.	Dates of Calving.	Weights (June 22) *lbs.*		A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.		
							lbs. qrs.	*lbs. qrs.*	*lbs. qrs.*	*lbs. qrs.*	*lbs. qrs.*	*lbs. qrs.*	*lbs. qrs.*	*lbs. qrs.*	*lbs. qrs.*	*lbs. qrs.*	*lbs. qrs.*	*lbs. qrs.*	*lbs.*	*lbs.*
Yield of Milk, &c.	1	Cross short-horn	Aged	May 1	1,078		18 2	10 14	13 2	10 11	17 11	10 9	18 2	11 12	17 8	7 3	18 3	11 0	198 13	28 6
	2	Cross short-horn	6	Feb. 15	1,190		13 3	7 13	13 0	8 4	12 7	7 10	12 10	8 2	12 7	7 9	13 4	7 1	144 12	20 11
	3	Cross short-horn	3	April 13	804		12 7	7 7	13 2	7 10	12 13	7 14	12 14	8 3	12 10	11 3	13 0	7 12	147 2	21 0
	4	Cross short-horn	8	May 20	1,069		22 5	15 0	21 11	14 15	21 7	14 2	22 6	14 8	21 11	14 10	23 3	12 10	257 4	36 12
	5	Cross short-horn	7	April 17	1,097		18 0	10 8	18 10	10 4	16 0	11 0	17 0	10 12	18 2	11 13	18 2	12 1	199 0	28 7
				Totals	5,238		84 1	51 12	84 9	51 12	80 6	51 3	83 0	53 5	82 6	52 6	86 1	50 8	946 15	
				Means	1,048		16 13	10 6	16 14	10 6	16 1	10 4	16 9	10 11	16 7	10 8	17 3	10 2	189 6	27 1

Ten Cows.—Sewaged Meadow Grass.

					Five-acre, Plot 3, Crop 2.		Five-acre, Plot 3, Crop 2.		Five-acre, Plot 3, Crop 2.		Ten-acre, Plot 3, Crop 2.		Ten-acre, Plot 3, Crop 2.		Ten-acre, Plot 3, Crop 2.		Ten-acre, Plot 3, Crop 2.			
Grass consumed.	From which Field, Plot, and Crop																			
	Quantities weighed (*tons. cwts. qrs. lbs.*)				0 16 3 23		0 17 3 18		0 18 3 27		0 12 0 0		0 15 1 21		0 12 2 12		0 12 2 18		5 6 2 7	0 1 2 2
Yield of Milk, &c.	1	Cross short-horn	Aged	Mar. 10	1,121	15 10	11 13	17 6	12 9	17 3	12 5	17 12	11 6	16 4	12 7	17 3	9 14	15 7	12 0	199 8	28 8
	2	Cross short-horn	8	June 15	1,280	21 4	15 4	22 8	16 2	22 0	15 14	22 12	16 8	22 6	16 8	23 4	14 6	22 10	16 0	267 6	38 3
	3	Cross short-horn	6	Feb. 20	1,066	14 1	12 6	14 5	12 10	14 1	11 10	13 11	11 7	13 7	11 2	13 0	10 0	12 7	11 7	175 10	25 2
	4	Cross short-horn	7	Feb. 15	996	12 10	9 14	14 3	8 15	14 0	9 6	14 0	9 13	14 0	9 12	15 0	9 4	14 3	9 8	164 8	23 8
	5	Ayrshire - -	8	Feb. 28	1,000	13 4	9 7	15 4	8 11	14 13	10 2	13 10	9 8	13 4	9 12	13 12	9 3	14 4	9 11	164 9	23 8
	6	Cross short-horn	6	April 14	958	17 2	11 2	18 0	12 3	17 15	11 7	18 14	12 6	17 11	11 9	17 2	10 5	18 0	11 9	205 6	29 5
	7	Mongrel - -	Aged	April 12	894	12 13	9 2	14 4	8 3	14 0	9 4	14 0	9 11	14 12	9 5	15 0	8 0	14 10	9 4	162 4	23 3
	8	Cross short-horn	6	April 16	1,068	11 2	9 6	11 8	9 12	12 5	9 2	11 4	10 0	11 0	9 10	11 0	9 8	12 0	8 9	146 2	20 14
	9	Cross short horn	7	April 13	964	16 0	11 11	18 9	10 7	17 15	11 8	15 11	12 11	16 1	14 12	15 6	11 10	16 8	10 4	199 1	28 7
	10	Half short-horn	8	April 25	1,186	22 0	14 6	23 0	14 15	22 12	15 5	22 9	14 4	21 10	10 14	23 2	13 8	22 6	14 4	254 15	36 7
				Totals	10,533	155 14	114 8	168 15	114 7	167 0	115 15	164 3	117 10	160 7	115 11	164 2	105 10	162 7	112 8	1,939 5	
				Means	1,053	15 9	11 7	16 14	11 7	16 11	11 10	16 7	11 12	16 1	11 9	16 7	10 9	16 4	11 4	193 15	27 11

Five Cows.—Unsewaged or Sewaged Italian Rye Grass.

					Rye, Plot 3, Crop 3.		Rye, Plot 3, Crop 3.		Rye, Plot 3, Crop 3.		Rye, Plot 3, Crop 3.		Rye, Plot 3, Crop 3.		Rye, Plot 3, Crop 3.		Rye, Plot 3, Crop 3.			
Grass consumed.	From which Field, Plot, and Crop																			
	Quantities weighed (*tons. cwts. qrs. lbs.*)				0 10 1 6		0 7 1 19		0 6 0 23		0 11 0 16		0 6 3 23		0 6 3 23		0 7 0 0		2 15 3 26	0 1 2 11
Yield of Milk, &c.	1	Cross short horn	Aged	April 20	1,122	21 8	13 13	22 9	15 5	22 6	14 0	22 2	14 1	22 0	13 12	21 8	13 14	21 8	13 12	252 2	36 0
	2	Ayrshire - -	6	Mar. 15	878	17 7	11 2	19 8	10 9	18 12	11 0	17 12	11 4	18 14	11 2	18 0	10 5	17 11	10 7	203 13	29 2
	3	Cross short-horn	Aged	Mar. 1	1,087	14 1	9 0	14 11	9 3	14 12	10 1	15 8	9 12	14 4	9 10	14 14	8 15	14 10	4 7	164 2	23 7
	4	Cross short-horn	Aged	April 15	1,180	19 1	13 0	19 9	13 0	19 1	12 14	18 6	11 8	17 0	13 6	18 0	11 4	18 12	10 7	215 4	30 12
	5	Cross short-horn	6	Jan. 2	1,128	11 3	8 0	11 9	8 3	11 7	8 5	11 6	8 0	12 0	7 14	13 0	7 4	12 0	8 15	139 2	19 14
				Totals	5,395	83 4	54 15	87 14	56 10	86 6	56 4	85 2	54 9	84 2	55 12	85 6	51 10	84 9	48 0	974 7	
				Means	1,079	16 10	11 0	17 9	11 5	17 5	11 4	17 0	10 15	16 13	11 2	17 1	10 5	16 15	9 10	194 14	27 12

Detailed Record of Food consumed, and Milk yielded, by Cows fed on Unsewaged and Sewaged Meadow Grass, and on Italian Rye Grass (without Oilcake).
Third Season, 1863 ; 7 days.—July 7 to July 13.

Five Cows.—Unsewaged Meadow Grass.

Grass consumed.						Tuesday.		Wednesday.		Thursday.	Friday.	Saturday.	Sunday.	Monday.	Total in 7 days.	Per head per day.
	From which Field, Plot, and Crop					—		—		Ten-acre, Plot 1, Crop 1.	Ten-acre, Plot 1, Crop 1.	Ten-acre, Plot 1, Crop 1.	Five-acre, Plot 1, Crop 1.	Five-acre, Plot 1, Crop 1.	—	—
	Quantities weighed (*tons. cwts. qrs. lbs.*)					—		—		0 4 2 24½	0 3 1 8½	0 4 3 10½	0 1 1 17½	0 1 1 20	0 15 2 20	0 0 1 22
Yield of Milk, &c.	Cows. Nos.	Breed.	Years old.	Dates of Calving.	Weights (June 22) *lbs.*	A.M.	P.M.	A.M.	P.M.	A.M.	A.M.	A.M.	A.M.	A.M.	—	—
						lbs. *qrs.*	*lbs.* *qrs.*	*lbs.* *qrs.*	*lbs.* *qrs.*	*lbs.* *qrs.*	*lbs.* *qrs.*	*lbs.* *qrs.*	*lbs.* *qrs.*	*lbs.* *qrs.*	*lbs.* *qrs.*	*lbs.* *qrs.*
	1	Cross short-horn	Aged	May 1	1,078	17 13	10 8	17 8	10 12	18 0	17 0	18 0	18 2	18 11	201 4	28 12
	2	Cross short-horn	6	Feb. 15	1,190	12 7	8 6	12 11	8 8	12 7	12 10	12 12	12 7	13 11	146 9	20 15
	3	Cross short-horn	3	April 13	894	12 3	7 13	13 0	7 14	12 13	12 10	13 5	13 2	13 10	145 13	20 13
	4	Cross short-horn	8	May 20	1,069	21 8	15 0	22 1	15 14	21 5	21 0	23 0	21 10	24 0	258 14	37 0
	5	Cross short-horn	7	April 17	1,007	16 6	10 4	17 3	10 6	18 2	17 4	18 4	18 15	19 5	200 2	28 9
				Totals	5,238	80 5	51 15	82 7	53 6	82 11	80 8	85 5	84 4	89 5	932 10	—
				Means	1,048	16 1	10 6	16 8	10 11	16 9	16 1	17 1	16 13	17 14	190 8	27 3

Ten Cows.—Sewaged Meadow Grass.

Grass consumed.						Five-acre, Plot 3, Crop 2.		Five-acre, Plot 3, Crop 2.		Five-acre, Plot 3, Crop 2.	Ten-acre, Plot 3, Crop 2.	Ten-acre, Plot 3, Crop 2.	Five-acre, Plot 3, Crop 2.	Five-acre, Plot 3, Crop 2.	—	—
	From which Field, Plot, and Crop					—		—		Five-acre, Plot 3, Crop 2.	Ten-acre, Plot 3, Crop 2.	Ten-acre, Plot 3, Crop 2.	Five-acre, Plot 3, Crop 2.	Five-acre, Plot 3, Crop 2.	—	—
	Quantities weighed (*tons. cwts. qrs. lbs.*)					0 14 3 13		0 16 1 13		0 18 1 18	0 19 3 20	1 0 2 4	0 12 1 2	0 12 1 7	5 14 2 21	0 1 2 16
Yield of Milk, &c.	1	Cross short-horn	Aged	Mar. 10	1,121	15 6	12 14	16 0	13 2	17 4	16 6	17 0	16 10	17 0	201 0	28 11
	2	Cross short-horn	8	June 15	1,280	23 4	16 6	22 2	17 0	23 0	21 12	22 6	23 6	23 3	272 2	38 14
	3	Cross short-horn	6	Feb. 20	1,066	13 0	11 3	13 4	9 12	13 8	12 5	13 10	14 7	13 12	169 4	24 3
	4	Cross short-horn	7	Feb. 15	996	14 8	9 3	14 0	11 5	14 3	13 0	14 6	14 5	14 4	165 1	23 9
	5	Ayrshire – –	8	Feb. 22	1,000	14 10	9 8	14 3	10 4	14 4	13 8	14 2	14 4	14 12	166 6	23 12
	6	Cross short-horn	6	April 14	958	18 8	10 15	17 13	11 10	18 1	16 3	18 0	18 2	18 2	202 0	28 14
	7	Mongrel – –	Aged	April 12	894	14 2	8 14	14 2	10 2	18 0	14 0	14 5	15 0	16 1	172 1	24 9
	8	Cross short-horn	6	April 16	1,068	12 0	10 0	11 13	9 13	11 4	11 10	12 9	13 0	12 2	152 7	21 13
	9	Cross short horn	7	April 13	964	17 12	11 7	17 9	12 7	17 0	16 0	16 8	15 8	15 3	198 13	28 6
	10	Half short-horn	8	April 25	1,186	21 4	15 13	22 0	15 3	22 12	17 4	18 11	20 1	21 12	259 11	37 2
				Totals	10,533	164 6	116 3	162 14	120 10	169 4	119 5	153 7	164 0	164 11	1,938 13	—
				Means	1,053	16 7	11 10	16 5	12 1	16 15	11 15	15 5	16 6	16 7	195 14	28 0

Five Cows.—Unsewaged or Sewaged Italian Rye Grass.

Grass consumed.						Rye, Plot 3, Crop 3.		Rye, Plot 3, Crop 3.		Rye, Plot 3, Crop 3.	Rye, Plot 3, Crop 3.	Rye, Plot 3, Crop 3.	Rye, Plot 3, Crop 3.	Rye, Plot 3, Crop 3.	—	—
	From which Field, Plot, and Crop					—		—		Rye, Plot 3, Crop 3.	Rye, Plot 3, Crop 3.	Rye, Plot 3, Crop 3.	Rye, Plot 3, Crop 3.	Rye, Plot 3, Crop 3.	—	—
	Quantities weighed (*tons. cwts. qrs. lbs.*)					0 9 0 25		0 14 0 23		0 5 2 23	0 7 2 23	0 9 0 5	0 7 3 1	0 7 3 1	3 1 1 15	0 1 3 0
Yield of Milk, &c.	1	Cross short-horn	Aged	April 20	1,122	21 6	13 14	21 12	12 14	21 14	20 3	23 2	21 4	23 10	245 7	35 1
	2	Ayrshire – –	6	Mar. 15	878	17 0	12 0	17 9	9 6	17 0	18 11	16 12	16 3	17 7	191 12	27 6
	3	Cross short-horn	Aged	Mar. 1	1,087	18 1	8 8	15 3	9 7	14 14	10 9	13 0	14 2	14 6	169 1	24 3
	4	Cross short-horn	Aged	April 15	1,180	17 5	13 7	17 12	12 0	18 0	15 8	15 8	14 2	14 6	169 1	24 3
	5	Cross short-horn	6	Jan. 2	1,128	12 1	8 9	13 4	9 0	12 6	8 4	13 0	8 15	12 10	147 9	21 1
				Totals	5,395	85 13	55 6	85 8	52 11	84 2	54 1	83 14	73 7	88 2	971 5	—
				Means	1,079	17 3	11 1	17 2	10 9	16 13	10 13	16 12	14 12	17 14	194 4	27 12

Table X.—*continued.*

Detailed Record of Food consumed, and Milk yielded, by Cows fed on Unsewaged and Sewaged Meadow Grass, and on Italian Rye Grass (without Oilcake).
Third Season, 1863; 7 days.—July 14 to July 20.

Five Cows.—Unsewaged Meadow Grass.

						Tuesday.		Wednesday.		Thursday.		Friday.		Saturday.		Sunday.		Monday.		Total in 7 days.	Per head per day.
Grass consumed.	From which Field, Plot, and Crop					Five-acre, Plot 1, Crop 1.		Five-acre, Plot 1, Crop 1.		Five-acre, Plot 1, Crop 1.		Ten-acre, Plot 0?, Crop 1.		—		Five-acre, Plot 1, Crop 1.		Five-acre, Plot 1, Crop 1.		—	
	Quantities weighed (*tons. cwts. qrs. lbs.*)					0 2 0 5½		0 2 3 22½		0 2 1 1		0 5 1 14				0 3 1 6½		0 3 1 10		0 19 1 3½	0 0 2 6
Yield of Milk, &c.	Cows. Nos.	Breed.	Years old.	Dates of Calving.	Weights July 20). *lbs.*	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	—	—
						lbs. qrs. lbs.	*lbs. qrs. lbs.*	*lbs. qrs. lbs.*	*lbs. qrs. lbs.*	*lbs. qrs. lbs.*	*lbs. qrs. lbs.*	*lbs. qrs. lbs.*	*lbs. qrs. lbs.*	*lbs. qrs. lbs.*	*lbs. qrs. lbs.*	*lbs. qrs. lbs.*	*lbs. qrs. lbs.*	*lbs. qrs. lbs.*	*lbs. qrs. lbs.*	*lbs.*	*lbs.*
	1	Cross short-horn	Aged	May 1	1,114	17 10	10 14	17 6	11 0	18 9	11 2	17 1	10 8	15 3	11 12	18 0	10 10	19 0	11 1	201 14	28 14
	2	Cross short-horn	6	Feb. 15	1,225	12 12	8 0	13 6	8 3	13 8	8 1	12 10	7 3	12 3	8 1	14 7	7 2	14 10	8 2	148 4	21 3
	3	Cross short-horn	3	April 13	859	12 6	8 14	12 15	8 15	13 0	7 3	12 4	7 4	12 2	8 4	12 5	7 0	13 11	7 14	144 1	20 9
	4	Cross short-horn	8	May 20	1,092	22 0	14 10	22 3	15 0	22 8	15 8	21 7	15 0	22 0	14 1	21 5	14 6	23 7	10 5	253 12	36 4
	5	Cross short-horn	7	April 17	1,142	17 3	11 1	16 12	11 8	17 6	9 12	17 0	10 8	16 15	11 8	18 1	10 0	19 0	14 10	201 4	28 12
				Totals	5,404	81 15	53 7	82 10	54 10	84 15	51 10	80 6	50 7	80 9	53 10	84 2	49 2	89 12	52 0	949 8	—
				Means	1,081	16 6	10 11	16 8	10 15	17 0	10 5	16 1	10 1	16 2	10 12	16 13	9 13	17 15	10 7	189 13	27 2

Ten Cows.—Sewaged Meadow Grass.

						Five-acre, Plot 3, Crop 2.		Five-acre, Plot 2, Crop 2.		Five-acre, Plot 2, Crop 2.		Five-acre, Plot 2, Crop 2.		Five-acre, Plot 2, Crop 2.		Five-acre, Plot 2, Crop 2.		Five-acre, Plot 2, Crop 2.		—	—
Grass consumed.	From which Field, Plot, and Crop																				
	Quantities weighed (*tons. cwts. qrs. lbs.*)					0 13 1 2		0 9 3 19		0 12 3 16		0 15 3 14		0 19 2 7		0 13 2 24		0 13 2 23		4 18 3 21	0 1 1 18
Yield of Milk, &c.																					
	1	Cross short-horn	Aged	Mar. 10	1,154	18 2	11 6	17 0	11 3	16 14	11 10	16 4	12 4	15 12	12 4	16 6	11 10	17 8	9 8	197 11	28 4
	2	Cross short-horn	8	June 15	1,334	21 3	16 2	22 14	16 4	22 7	15 7	22 3	15 2	21 6	15 0	22 0	14 15	23 4	13 0	261 3	37 5
	3	Cross short-horn	6	Feb. 20	1,145	13 12	10 1	14 8	10 12	14 6	10 14	14 8	10 4	14 8	10 4	14 6	11 4	14 5	10 5	174 1	24 14
	4	Cross short-horn	7	Feb. 15	1,040	14 0	9 5	14 6	9 14	14 0	9 1	14 3	9 6	13 9	9 3	14 7	9 0	15 3	8 0	163 9	23 6
	5	Ayrshire - -	8	Feb. 15	1,040	13 10	10 0	13 10	9 6	13 12	10 2	14 10	10 1	13 10	9 2	15 4	9 6	15 6	8 6	166 5	23 12
	6	Cross short-horn	6	April 14	1,016	17 4	10 12	17 10	10 8	17 11	11 9	18 2	10 9	17 4	12 2	18 0	11 0	19 2	10 7	202 0	28 14
	7	Mongrel - -	Aged	April 12	892	13 8	8 8	13 6	8 9	13 14	8 12	14 14	8 6	14 0	8 14	14 12	10 0	16 2	8 0	161 9	23 1
	8	Cross short-horn	6	April 16	1,122	12 6	9 6	11 10	10 15	11 12	10 7	11 1	10 6	11 0	9 14	11 1	8 8	11 0	8 10	148 0	21 2
	9	Cross short-horn	7	April 13	1,046	14 7	11 10	16 0	11 0	15 0	13 0	14 6	9 0	15 6	10 5	14 10	11 2	18 4	9 0	183 2	26 3
	10	Half short-horn	8	April 25	1,226	20 0	15 10	20 4	15 1	20 0	13 14	22 4	14 5	21 2	14 0	21 6	12 4	22 3	12 4	244 9	34 15
				Totals	11,055	158 4	117 12	161 4	113 8	159 12	114 12	162 7	109 11	157 9	111 0	162 4	109 1	172 5	97 8	1,902 1	—
				Means	1,106	15 13	11 4	16 2	11 6	16 0	11 8	16 4	10 15	15 12	11 1	16 4	10 14	17 4	9 12	190 3	27 3

Five Cows.—Unsewaged or Sewaged Italian Rye Grass.

						Rye, Plot 2, Crop 3.		Rye, Plot 2, Crop 3.		Rye, Plot 2, Crop 3.		Rye, Plot 2, Crop 3.		Rye, Plot 2, Crop 3.		Rye, Plot 2, Crop 3.		Rye, Plot 2, Crop 3.		—	—
Grass consumed.	From which Field, Plot, and Crop																				
	Quantities weighed (*tons. cwts. qrs. lbs.*)					0 10 0 5		0 8 1 23		0 7 0 12		0 7 0 0		0 10 0 21		0 6 1 23		0 6 2 0		2 15 3 0	0 1 2 10
Yield of Milk, &c.																					
	1	Cross short-horn	Aged	April 20	1,140	21 9	13 2	22 3	13 11	21 6	13 11	21 8	13 2	20 3	13 9	21 0	13 1	24 1	11 12	243 14	34 13
	2	Ayrshire - -	6	Mar. 15	910	16 7	11 0	16 15	11 3	16 12	10 3	17 0	10 14	16 10	10 14	18 2	9 4	17 0	10 8	192 12	27 9
	3	Cross short-horn	Aged	Mar. 1	1,130	15 0	8 10	14 14	9 2	14 12	9 0	15 0	8 4	14 11	9 0	14 12	8 10	15 8	7 15	165 2	23 9
	4	Cross short-horn	Aged	April 15	1,218	18 6	12 1	19 0	12 1	18 12	11 6	20 1	11 15	18 9	12 4	19 2	11 4	18 2	12 8	215 7	30 12
	5	Cross short-horn	6	Jan. 2	1,184	12 0	7 15	12 4	8 13	12 1	7 6	12 4	7 6	12 0	7 6	12 2	8 8	11 14	7 0	138 15	19 14
				Totals	5,582	83 6	52 12	85 4	54 14	83 11	51 10	85 13	51 9	82 1	53 1	85 2	50 11	86 9	49 11	956 2	—
				Means	1,116	16 11	10 9	17 1	11 0	16 12	10 5	17 2	10 5	16 7	10 10	17 0	10 2	17 5	9 15	191 4	27 5

Detailed Record of Food consumed, and Milk yielded, by Cows fed on Unsewaged and Sewaged Meadow Grass, and on Italian Rye Grass, with Oilcake in addition.
Third Season, 1863; 7 days.—July 21 to July 27.

Five Cows.—Unsewaged Meadow Grass.

Food consumed.		Tuesday.	Wednesday.	Thursday.	Friday.	Saturday.	Sunday.	Monday.	Total in 7 days.	Per head per day.
Grass	From which Field, Plot, and Crop	Five acre, Plot 1, Crop 1.	Ten acre, Plot 0*, Crop 1.	Ten-acre, Plot 0*, Crop 1.	Ten-acre, Plot 0*, Crop 1.	Ten-acre, Plot 0*, Crop 1.	Ten-acre, Plot 0*, Crop 1.	Ten-acre, Plot 0*, Crop 1.	—	—
	Quantities weighed (*tons. cwts. qrs. lbs.*)	0 2 3 8½	0 3 2 1	0 2 2 7¼	0 4 0 27	0 1 3 9½	0 2 3 20½	0 2 3 24	1 0 3 9	0 0 2 11
Oilcake (cotton-cake) – (*ditto*)		0 0 0 15	0 0 0 15	0 0 0 15	0 0 0 15	0 0 0 15	0 0 0 15	0 0 0 15	0 0 3 21	0 0 0 3

Yield of Milk, &c.	Cows. Nos.	Breed.	Years old.	Dates of Calving.	Weights (July 20) lbs.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	—	—
						lbs. qrs.	lbs. qrs.	lbs. qrs.	lbs. qrs.	lbs. qrs.	lbs. qrs.	lbs. qrs.	lbs. qrs.	lbs. qrs.	lbs. qrs.	lbs. qrs.	lbs. qrs.	lbs. qrs.	lbs. qrs.	lbs. qrs.	lbs. qrs.
	1	Cross short-horn	Aged	May 1	1,114	17 4	12 12	18 5	16 0	19 1	11 14	19 0	10 12	19 12	11 2	19 4	12 0	21 10	12 3	220 15	31 9
	2	Cross short-horn	6	Feb. 15	1,225	12 12	8 10	14 4	9 1	13 7	8 4	13 14	8 8	14 4	8 4	14 0	8 9	14 11	8 3	156 11	22 6
	3	Cross short-horn	3	April 18	850	12 12	8 6	15 10	9 7	12 12	8 9	14 0	8 9	13 12	8 4	14 12	8 8	15 6	7 15	156 10	22 6
	4	Cross short-horn	8	May 20	1,092	21 4	15 3	24 10	18 1	22 12	15 10	24 2	14 15	24 10	14 2	22 12	16 2	25 6	14 14	274 7	39 3
	5	Cross short-horn	7	April 17	1,142	17 9	12 4	19 14	10 15	17 11	10 6	17 10	10 15	17 14	11 1	18 8	9 12	19 8	11 2	205 1	29 5
				Totals	5,404	81 9	57 3	90 11	63 8	85 11	54 11	88 10	53 11	90 4	52 13	89 4	54 15	96 9	54 5	1,013 12	—
				Means	1,081	16 5	11 7	18 2	12 11	17 2	10 15	17 11	10 12	18 1	10 9	17 14	11 0	19 5	10 14	202 12	28 15

Ten Cows.—Sewaged Meadow Grass.

Food consumed.		Five-acre, Plot 2, Crop 2.	Ten-acre, Plot 0*, Crop 2.	Ten-acre, Plot 2, Crop 2.	Ten-acre, Plot 2, Crop 2.	Ten-acre, Plot 2, Crop 2.	Ten-acre, Plot 2, Crop 2.	Ten-acre, Plot 2, Crop 2.	—	—
Grass	From which Field, Plot, and Crop									
	Quantities weighed (*tons. cwts. qrs. lbs.*)	1 4 0 17	0 11 0 9	0 6 2 11	0 14 2 7	0 13 1 25	0 14 0 17	0 14 0 22	4 18 0 25	0 1 1 17
Oilcake (cotton-cake) – (*ditto*)		0 0 1 2	0 0 1 2	0 0 1 2	0 0 1 2	0 0 1 2	0 0 1 2	0 0 1 2	0 1 3 14	0 0 0 3

Yield of Milk, &c.																					
	1	Cross short-horn	Aged	Mar. 10	1,174	14 11	13 8	18 2	15 1	16 7	12 8	16 12	13 2	16 14	12 4	17 6	13 12	18 0	13 4	211 11	30 4
	2	Cross short-horn	8	June 15	1,284	21 0	15 0	23 11	16 2	22 8	15 0	22 0	14 11	22 2	14 5	23 2	15 0	24 6	13 13	283 12	37 11
	3	Cross short-horn	6	Feb. 20	1,246	13 10	12 6	13 14	11 3	13 15	11 4	13 6	11 0	13 8	11 2	14 2	10 4	14 0	10 11	174 5	24 14
	4	Cross short-horn	7	Feb. 15	1,240	13 6	10 4	16 8	10 12	14 10	10 2	14 11	9 2	15 8	9 0	15 10	9 14	15 8	8 6	173 5	24 12
	5	Ayrshire – –	8	Feb. 22	1,129	13 0	10 8	15 7	11 0	14 8	9 11	14 15	10 4	15 4	9 6	15 7	9 0	15 12	9 4	173 6	24 12
	6	Cross short-horn	6	April 14	1,016	17 2	12 9	20 13	12 15	18 12	11 12	19 2	11 14	20 2	11 7	20 6	11 10	21 2	12 0	221 6	31 10
	7	Monerel – –	Aged	April 12	892	13 2	11 11	17 6	10 11	14 6	9 10	15 1	9 6	14 10	9 10	15 6	9 6	16 10	8 15	175 14	25 2
	8	Cross short-horn	6	April 16	1,122	10 8	11 0	11 15	10 13	11 12	10 1	11 10	9 0	13 0	10 2	12 8	10 8	12 4	8 6	153 7	21 15
	9	Cross short-horn	7	April 18	1,045	15 6	13 8	18 1	14 12	17 5	12 8	16 8	12 14	20 0	12 6	18 6	13 7	20 6	14 6	219 13	31 6
	10	Half short-horn	8	April 25	1,226	20 5	15 10	21 4	16 3	23 4	15 7	23 10	15 2	22 9	16 10	24 2	15 8	25 8	14 10	266 12	38 2
				Totals	11,055	152 2	127 0	177 1	126 8	167 7	117 15	167 11	116 3	173 9	116 4	176 7	118 5	183 8	113 11	2,083 11	—
				Means	1,106	15 3	12 11	17 11	12 11	16 12	11 13	16 12	11 10	17 6	11 10	17 10	11 13	18 6	11 6	208 6	29 1

Five Cows.—Unsewaged or Sewaged Italian Rye Grass.

Food consumed.		Rye, Plot 2, Crop 3.	Rye, Plot 2, Crop 3.	Rye, Plot 2, Crop 3.	Rye, Plot 2, Crop 3.	Rye, Plot 2, Crop 3.	Rye, Plot 2, Crop 3.	Rye, Plot 2, Crop 3.	—	—
Grass	From which Field, Plot, and Crop									
	Quantities weighed (*tons. cwts. qrs. lbs.*)	0 6 3 3	0 7 0 9	0 10 1 23	0 5 2 24	0 7 0 11	0 6 3 7	0 6 3 8	2 10 3 1	0 1 1 22
Oilcake (cotton-cake) – (*ditto*)		0 0 0 15	0 0 0 15	0 0 0 15	0 0 0 15	0 0 0 15	0 0 0 15	0 0 0 15	0 4 3 21	0 0 0 3

Yield of Milk, &c.																					
	1	Cross short-horn	Aged	April 20	1,140	20 1	13 12	25 2	14 14	22 8	13 10	22 8	12 5	23 13	13 14	22 8	14 10	22 10	16 0	258 3	36 14
	2	Ayrshire – –	6	Mar. 15	920	16 3	11 0	16 8	11 2	16 4	11 6	15 10	10 7	17 0	10 11	17 12	10 12	19 0	10 7	194 2	27 12
	3	Cross short-horn	Aged	Mar. 1	1,130	14 0	9 6	15 1	9 5	14 8	9 0	13 11	8 11	16 0	9 3	15 2	9 10	15 3	8 12	168 8	24 1
	4	Cross short-horn	Aged	April 15	1,258	16 3	12 13	19 0	13 14	18 1	12 12	21 0	10 6	19 0	11 9	20 2	12 8	23 12	12 10	223 10	31 15
	5	Cross short-horn	6	Jan. 2	1,134	11 10	7 13	13 15	8 4	12 11	7 8	12 8	8 7	13 4	7 13	13 6	8 2	12 5	9 12	147 6	21 1
				Totals	5,582	78 1	54 12	90 10	57 7	84 0	54 4	85 5	50 4	89 1	53 2	88 14	55 10	92 14	57 9	991 13	—
				Means	1,116	15 10	10 15	18 2	11 8	16 13	10 14	17 1	10 1	17 13	10 10	17 12	11 2	18 9	11 8	198 6	28 5

* Unmeasured land; designated Plot 0 when unsewaged, and Plot 00 when sewaged.

Table X.—*continued.*

Detailed Record of Food consumed, and Milk yielded, by Cows fed on Unsewaged and Sewaged Meadow Grass, and on Italian Rye Grass, with Oilcake in addition. Third Season, 1863; 7 days.—July 28 to August 3.

Five Cows.—Unsewaged Meadow Grass. *a*

					Tuesday.		Wednesday.		Thursday.		Friday.		Saturday.		Sunday.		Monday.		Total in 7 days.	Per head per day.
Food consumed.	Grass: From which Field, Plot, and Crop				Five-acre, Plot 1, Crop 1.		—		Five-acre, Plot 0*, Crop 1.		Ten-acre, Plot 0*, Crop 1.		Ten-acre, Plot 0*, Crop 1.		Rye, Plot 1, Crop 3.		Rye, Plot 1, Crop 3.		—	—
	Grass: Quantities weighed (*tons cwts. qrs. lbs.*)				0 3 3 13½		—		0 1 2 13		0 2 3 1½		0 3 1 6½		0 2 2 19½		0 2 2 21		0 16 3 19	0 0 1 26
	Oilcake (cotton-cake) – (*ditto*)				0 0 0 15		0 0 0 15		0 0 0 15		0 0 0 15		0 0 0 15		0 0 0 15		0 0 0 15		0 0 3 21	0 0 0 3
Yield of Milk, &c.	Cows. Nos.	Breed.	Years old.	Dates of Calving.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	—	—
					lbs. ozs.	*lbs. ozs.*	*lbs. ozs.*	*lbs. ozs.*	*lbs. ozs.*	*lbs. ozs.*	*lbs. ozs.*	*lbs. ozs.*	*lbs. ozs.*	*lbs. ozs.*	*lbs. ozs.*	*lbs. ozs.*	*lbs. ozs.*	*lbs. ozs.*	*lbs.*	*lbs.*
	1	Cross short-horn	Aged	May 1	20 6	15 2	20 10	12 9	20 4	11 13	21 10	13 0	21 10	13 1	20 12	13 3	21 5	14 6	236 13	33 13
	2	Cross short-horn	6	Feb. 15	13 10	9 2	14 2	8 6	13 11	8 3	13 10	8 2	13 8	8 9	12 10	8 8	15 8	8 11	156 4	22 5
	3	Cross short-horn	3	April 13	15 8	9 11	16 2	9 4	14 14	8 4	15 0	9 10	14 10	10 7	16 1	9 10	14 5	7 8	170 14	24 7
	4	Cross short-horn	8	May 20	24 4	16 2	25 4	15 8	23 7	15 6	24 8	14 14	25 0	16 2	23 4	16 1	23 8	13 12	276 14	39 9
	5	Cross short-horn	7	April 17	19 0	11 2	18 13	10 13	17 6	10 10	17 6	11 5	17 2	9 10	17 8	11 3	17 3	10 2	199 3	28 7
				Totals	92 12	59 1	94 15	56 8	89 10	54 4	91 3	57 0	91 14	57 13	90 3	58 9	91 13	54 7	1,040 0	—
				Means	18 9	11 13	19 0	11 5	17 15	10 13	18 4	11 6	18 6	11 9	18 1	11 11	18 6	10 14	208 0	29 11

Ten Cows.—Sewaged Meadow Grass.

					Five-acre, Plot 2, Crop 2.	Ten-acre, Plot 2, Crop 2.	Ten-acre, Plot 2, Crop 2.	Five-acre, Plot 00*, Crop 2.	Ten-acre, Plot 4, Crop 3.	Five-acre, Plot 4, Crop 3.	Five-acre, Plot 4, Crop 3.	—	—
Food consumed.	Grass: From which Field, Plot, and Crop												
	Grass: Quantities weighed (*tons cwts. qrs. lbs.*)				0 14 3 15	0 18 0 9	1 1 0 23	0 16 3 5‡	0 9 3 12	0 15 2 4	0 15 2 9	5 11 3 21	0 1 2 11
	Oilcake (cotton cake) – (*ditto*)				0 0 1 2	0 0 1 2	0 0 1 2	0 0 1 2	0 0 1 2	0 0 1 2	0 0 1 2	0 1 3 14	0 0 0 3
Yield of Milk, &c.													
	1	Cross short-horn	Aged	Mar. 10	1,154	17 0 14 6	17 11 14 0	17 12 12 10	16 6 13 10	18 0 13 12	18 9 12 13	18 8 11 10	216 11 30 15
	2	Cross short-horn	8	June 15	1,384	21 10 16 1	24 0 16 7	22 12 15 9	22 4 16 1	23 2 13 14	23 9 15 13	23 12 16 2	273 0 39 0
	3	Cross short-horn	6	Feb. 20	1,146	13 6 12 3	14 12 10 5	14 5 10 13	13 14 11 0	13 12 9 12	14 0 9 8	13 11 10 9	174 3 24 14
	4	Cross short-horn	7	Feb. 15	1,040	14 0 10 2	15 6 9 4	14 13 9 2	14 4 10 14	15 12 9 12	14 13 10 1	14 12 8 15	174 13 25 0
	5	Ayrshire – –	8	Feb. 22	1,029	14 6 10 12	15 4 8 9	14 6 9 7	15 5 10 6	15 0 10 5	14 6 9 1	14 12 8 15	170 14 24 7
	6	Cross short-horn	6	April 14	1,016	19 4 12 5	21 0 11 3	20 0 11 8	19 7 13 0	21 2 12 0	19 3 12 3	20 6 12 0	224 9 32 1
	7	Mongrel – –	Aged	April 12	892	14 0 10 9	16 0 9 9	15 12 9 5	15 2 10 12	15 8 10 14	16 4 9 6	15 3 7 14	176 2 25 3
	8	Cross short-horn	6	April 16	1,122	11 10 11 3	11 7 10 5	12 4 10 1	13 4 10 4	14 12 9 14	14 12 9 15	12 10 10 10	162 15 23 4
	9	Cross short-horn	7	April 13	1,046	19 0 13 6	19 4 16 0	19 0 13 3	18 12 13 0	21 0 9 12	19 8 12 7	18 6 11 5	223 15 32 0
	10	Half short-horn	8	April 25	1,226	22 0 17 14	24 3 14 9	23 10 15 2	21 8 16 11	23 4 15 12	23 12 15 11	25 0 13 2	272 2 38 14
				Totals	11,055	166 4 128 13	178 15 129 3	174 10 116 12	170 2 125 10	181 4 120 0	178 12 116 14	179 2 111 15	2,069 4 —
				Means	1,106	16 10 12 14	17 14 12 0	17 8 11 11	17 0 12 9	18 2 12 0	17 14 11 11	17 15 11 3	206 15 29 9

Five Cows.—Unsewaged or Sewaged Italian Rye Grass.

					Rye, Plot 2, Crop 3.	Rye, Plot 3, Crop 4.	Rye, Plot 3, Crop 4.	Rye, Plot 3, Crop 4.	Rye, Plot 3, Crop 4.	Rye, Plot 3, Crop 4.	Rye, Plot 3, Crop 4.	—	—
Food consumed.	Grass: From which Field, Plot, and Crop												
	Grass: Quantities weighed (*tons cwts. qrs. lbs.*)				0 7 0 1	0 8 3 15§	0 7 1 23	0 9 1 1	0 7 2 0	0 4 0 23	0 4 1 0	2 8 2 7	0 1 1 15
	Oilcake (cotton-cake) – (*ditto*)				0 0 0 15	0 0 0 15	0 0 0 15	0 0 0 15	0 0 0 15	0 0 0 15	0 0 0 15	0 0 3 21	0 0 0 3
Yield of Milk, &c.													
	1	Cross short-horn	Aged	April 20	1,140	21 2 16 5	22 0 13 2	21 12 13 14	22 2 14 0	22 6 12 0	22 0 15 6	21 7 12 3	249 11 35 11
	2	Ayrshire – –	6	Mar. 15	910	18 4 10 11	18 4 9 12	17 11 10 4	17 1 10 10	17 3 9 12	18 5 10 15	18 0 9 10	196 6 28 1
	3	Cross short-horn	Aged	Mar. 1	1,130	15 8 9 12	15 2 9 5	15 8 9 5	15 9 9 3	16 6 9 0	14 8 10 9	15 6 9 0	174 1 24 14
	4	Cross short-horn	Aged	April 15	1,218	16 10 13 7	19 3 10 0	19 1 11 13	20 15 12 13	20 12 12 10	21 9 13 1	19 2 12 14	223 13 31 15
	5	Cross short-horn	6	Jan. 2	1,184	12 10 8 14	12 7 8 2	12 0 8 4	12 3 9 8	12 1 7 8	11 14 8 9	11 10 8 0	143 10 20 8
				Totals	5,582	84 2 59 1	87 0 50 5	86 0 53 8	87 14 56 1	88 12 50 14	88 4 58 8	85 9 51 11	987 9 —
				Means	1,116	16 13 11 13	17 6 10 1	17 3 10 11	17 9 11 4	17 12 10 3	17 10 11 11	17 2 10 6	197 8 28 3

* Unmeasured land; designated Plot 0 when unsewaged, and Plot 00 when sewaged.

† Including 7 cwts. 1 qr. 1 lb. from Ten-acre, Plot 2, Crop 2.

† In these cases the weights recorded are of an intermediate weighing taken on August 3.

§ 2 cwts. 3 qrs. 6 lbs. of this quantity came from Rye, Plot 2, Crop 3.

Detailed Record of Food consumed, and Milk yielded, by Cows fed on Unsewaged and Sewaged Meadow Grass, and on Italian Rye Grass, with Oilcake in addition.
Third Season, 1863; 7 days.—August 4 to August 10.

Five Cows.—Unsewaged Meadow Grass. *a*

Food consumed.		Tuesday.	Wednesday.	Thursday.	Friday.	Saturday.	Sunday.	Monday.	Total in 7 days.	Per head per day.
Grass	From which Field, Plot, and Crop	Rye, Plot 1, Crop 3.	Rye, Plot 1, Crop 3.	Rye, Plot 1, Crop 3.	Rye, Plot 1, Crop 3.	Rye, Plot 1, Crop 3.	Rye, Plot 1, Crop 3.	Rye, Plot 1, Crop 3.		
	Quantities weighed (*tons. cwts. qrs. lbs.*)	0 5 3 17½	0 5 0 4½	0 1 1 2½	0 4 1 10	0 3 2 10½	0 3 2 4½	0 3 2 8	1 7 1 1½	0 0 3 3
Oilcake (cotton-cake) –	(*ditto*) –	0 0 0 15	0 0 0 15	0 0 0 15	0 0 0 15	0 0 0 15	0 0 0 15	0 0 0 15	0 0 3 21	0 0 0 3

Yield of Milk, &c.	Cows. Nos.	Breed.	Years old.	Dates of Calving.	Weights (July 20) *lbs.*	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.		
						lbs.	*qrs.*	*lbs.*	*qrs.*	*lbs.*	*qrs.*	*lbs.*	*qrs.*	*lbs.*	*qrs.*	*lbs.*	*qrs.*	*lbs.*	*qrs.*	*lbs.*	*qrs.*
	1	Cross short-horn	Aged	May 1	1,138*	18 0	12 12	18 12	13 8	21 10	14 0	20 13	13 3	21 15	14 4	21 10	12 13	23 0	14 1	240	5
	2	Cross short-horn	6	Feb. 15	1,234*	14 3	9 0	13 11	8 6	14 4	9 0	14 0	8 0	12 10	8 10	13 8	7 3	12 6	8 9	153	6
	3	Cross short-horn	3	April 13	854*	16 1	10 8	15 6	9 13	16 11	9 10	16 2	9 12	15 10	10 13	15 10	8 11	15 5	9 1	179	1
	4	Cross short-horn	8	May 20	1,118*	26 1	16 4	24 15	16 4	26 12	15 12	26 4	14 9	23 11	15 8	26 13	14 0	25 0	15 14	287	11
	5	Cross short-horn	7	April 17	1,170*	17 11	12 8	18 14	10 8	18 12	11 6	18 10	11 0	17 0	12 7	17 8	10 12	19 1	10 11	206	12
				Totals	5,514	92 0	61 0	91 10	58 7	98 1	59 12	95 13	56 8	90 14	61 10	95 1	53 7	94 12	58 4	1,067	3
				Means	1,103	18 6	12 3	18 5	11 11	19 10	11 15	19 3	11 5	18 3	12 5	19 0	10 11	18 15	11 11	213	7

Ten Cows.—Sewaged Meadow Grass.

Food consumed.		Five-acre, Plot 4, Crop 3.	Five-acre, Plot 4, Crop 3.	Five-acre, Plot 4, Crop 3.	Five-acre, Plot 4, Crop 3.	Ten-acre, Plot 4, Crop 3.	Five-acre, Plot 3, Crop 3.	Five-acre, Plot 3, Crop 3.		
Grass	From which Field, Plot, and Crop									
	Quantities weighed (*tons. cwts. qrs. lbs.*)	0 18 0 3	0 15 0 2	0 19 1 16	0 19 0 14	0 15 1 23	0 15 0 14	0 15 0 16	5 17 1 4	0 1 2 20
Oilcake (cotton-cake) –	(*ditto*) –	0 0 1 2	0 0 1 2	0 0 1 2	0 0 1 2	0 0 1 2	0 0 1 2	0 0 1 2	0 1 3 14	0 0 0 3

Yield of Milk, &c.																					
	1	Cross short-horn	Aged	Mar. 10	1,154	17 10	12 12	17 14	13 9	18 3	12 10	17 12	12 9	17 0	13 14	17 6	11 4	17 8	12 13	212	12	30	6
	2	Cross short-horn	8	June 15	1,384	22 11	15 8	22 3	16 0	21 12	15 11	21 0	15 10	22 4	15 3	21 8	13 0	21 12	14 3	258	5	36	14
	3	Cross short-horn	6	Feb. 20	1,146	13 10	10 6	13 4	11 1	12 14	11 0	13 8	10 0	13 12	10 1	13 10	9 2	14 7	9 14	166	9	23	13
	4	Cross short-horn	7	Feb. 15	1,040	15 11	10 0	16 0	11 5	16 8	11 11	15 12	11 6	16 1	9 13	15 0	9 8	15 6	9 10	183	11	26	4
	5	Ayrshire – –	8	Feb. 22	1,029	14 0	8 15	14 1	9 2	14 6	9 12	14 14	9 8	14 4	8 6	14 0	7 14	14 10	8 9	162	5	23	3
	6	Cross short-horn	6	April 14	1,016	20 1	11 7	19 2	11 3	20 4	12 0	19 14	11 10	19 2	11 4	19 10	10 0	20 2	11 14	217	9	31	1
	7	Mongrel – –	Aged	April 12	892	14 6	8 14	14 12	9 11	15 12	8 10	15 7	8 14	15 10	9 0	15 0	8 7	16 0	8 9	169	0	24	2
	8	Cross short-horn	6	April 16	1,122	12 0	9 3	12 2	9 6	11 0	10 8	11 9	9 14	11 10	9 10	12 2	9 0	12 0	11 5	151	5	21	10
	9	Cross short-horn	7	April 13	1,046	17 4	14 2	17 9	12 12	15 4	10 6	15 6	13 0	15 0	15 14	17 2	10 3	18 14	11 0	203	12	29	2
	10	Half short-horn	8	April 25	1,226	22 8	15 12	21 3	16 3	23 6	15 0	23 15	15 0	23 12	14 15	25 0	14 12	22 4	14 9	270	3	38	10
				Totals	11,055	169 13	116 15	168 2	120 4	171 5	117 4	169 1	117 7	168 7	118 0	170 6	103 2	172 15	112 6	1,995	7		
				Means	1,106	17 0	11 11	16 13	12 0	17 2	11 12	16 14	11 12	16 13	11 13	17 1	10 5	17 5	11 4	199	9	28	8

Five Cows.—Sewaged or Unsewaged Italian Rye Grass.

Food consumed.		Rye, Plot 3, Crop 4.	Rye, Plot 3, Crop 4.	Rye. Plot 3, Crop 4.	Rye, Plot 3, Crop 4.	Rye, Plot 3, Crop 4.	Rye, Plot 3, Crop 4.	Rye, Plot 3, Crop 4.		
Grass	From which Field, Plot, and Crop									
	Quantities weighed (*tons. cwts. qrs. lbs.*)	0 4 3 25	0 8 3 25	0 5 2 17	0 6 2 22	0 5 2 23	0 4 3 21	0 4 3 26	2 1 3 19	0 1 0 22
Oilcake (cotton-cake) –	(*ditto*) –	0 0 0 15	0 0 0 15	0 0 0 15	0 0 0 15	0 0 0 15	0 0 0 15	0 0 0 15	0 0 3 21	0 0 0 3

Yield of Milk, &c.																					
	1	Cross short-horn	Aged	April 20	1,140	21 8	15 6	22 10	14 8	21 10	13 4	23 2	12 10	24 0	12 8	13 11	13 4	23 10	13 10	245	5	35	1
	2	Ayrshire – –	6	Mar. 15	910	16 11	11 9	18 3	10 14	18 3	10 11	17 6	9 6	16 8	9 8	23 13	10 3	20 0	11 10	204	9	29	4
	3	Cross short-horn	Aged	Mar. 1	1,130	15 12	10 7	16 0	10 0	16 1	9 1	14 1	8 10	14 0	9 3	13 11	10 12	17 1	9 6	174	1	24	14
	4	Cross short-horn	Aged	April 15	1,218	21 2	14 12	21 3	13 13	21 13	12 4	21 4	13 0	20 14	13 10	21 8	11 15	24 5	12 14	244	5	34	14
	5	Cross short-horn	6	Jan. 2	1,184	12 7	6 0	9 0	7 4	11 6	7 14	12 14	7 2	11 12	8 10	11 10	8 10	13 4	7 13	135	10	19	6
				Totals	5,582	87 8	58 2	87 0	56 7	89 1	53 2	88 11	50 12	87 2	53 7	84 5	54 12	98 4	55 5	1,003	14		
				Means	1,116	17 8	11 10	17 6	11 5	17 13	10 10	17 12	10 2	17 7	10 11	16 14	10 15	19 10	11 1	200	12	28	11

* In these cases the weights recorded are of an intermediate weighing taken on August 3.
a. Other grass was given when unsewaged meadow grass was not available.

Table X.—*continued.*

Detailed Record of Food consumed, and Milk yielded, by Cows fed on Unsewaged and Sewaged Meadow Grass, and on Italian Rye Grass, with Oilcake in addition.
Third Season, 1863; 7 days.—August 11 to August 17.

Five Cows.—Unsewaged Meadow Grass. *a*

Food consumed.		Tuesday.	Wednesday.	Thursday.	Friday.	Saturday.	Sunday.	Monday.	Total in 7 days.	Per head per day.
Grass	From which Field, Plot, and Crop	Rye, Plot 1, Crop 3.	Rye, Plot 1, Crop 3.	Rye, Crop 3*.	Rye, Crop 3*.	Rye, Crop 3*.	Rye, Crop 3*.	Rye, Crop 3*.		
	Quantities weighed (*tons. cwts. qrs. lbs.*)	0 3 2 9½	0 2 1 17½	0 2 0 23	0 3 1 10	0 3 2 4	0 2 1 16	0 2 1 17	0 19 3 13	0 0 2 8
Oilcake (cotton-cake)	(*ditto*)	0 0 0 15	0 0 0 15	0 0 0 15	0 0 0 15	0 0 0 15	0 0 0 15	0 0 0 15	0 0 3 21	0 0 0 3

Yield of Milk, &c.	Cows. Nos.	Breed.	Years old.	Dates of Calving.	Weights (Aug. 17) *lbs.*	A.M. *lbs.*	*qrs.*	P.M. *lbs.*	*qrs.*	A.M. *lbs.*	*qrs.*	P.M. *lbs.*	*qrs.*	A.M. *lbs.*	*qrs.*	P.M. *lbs.*	*qrs.*	A.M. *lbs.*	*qrs.*	P.M. *lbs.*	*qrs.*	A.M. *lbs.*	*qrs.*	P.M. *lbs.*	*qrs.*	*lbs.*	*qrs.*	*lbs.*	*qrs.*
	1	Cross short-horn	Aged	May 1	1,176	20	3	14	7	22	0	13	0	21	12	15	3	21	14	13	4	20	10	13	8	22	0	13	6	245	15	35	2
	2	Cross short-horn	6	Feb. 15	1,253	13	0	8	2	14	0	8	0	13	8	7	14	12	12	8	6	13	0	7	0	15	2	7	7	148	14	21	4
	3	Cross short-horn	3	April 13	878	15	8	9	10	16	0	9	8	15	14	10	4	16	1	9	15	16	0	9	8	16	8	8	12	178	11	25	8
	4	Cross short-horn	8	May 20	1,118	25	10	16	6	24	2	15	12	25	15	15	7	25	8	16	4	25	8	14	3	25	1	14	0	285	10	40	13
	5	Cross short-horn	7	April 17	1,194	17	7	11	0	18	2	12	0	18	1	11	6	17	13	11	13	17	6	11	0	17	2	11	4	206	0	29	7
				Totals	5,619	91	12	59	9	91	11	59	4	95	14	58	1	94	10	61	1	93	8	56	5	91	15	54	13	1,065	2		
				Means	1,124	18	6	11	15	18	5	11	13	19	3	11	10	18	15	12	3	18	11	11	4	18	6	10	15	213	0	30	7

Ten Cows.—Sewaged Meadow Grass.

Food consumed.		Five-acre, Plot 3, Crop 3.	Ten-acre, Plot 4, Crop 3.	Ten-acre, Plot 4, Crop 3.	Five-acre, Plot 4, Crop 3.	Five-acre, Plot 4, Crop 3.	Five-acre, Plot 3, Crop 3.	Five-acre, Plot 3, Crop 3.		
Grass	From which Field, Plot, and Crop									
	Quantities weighed (*tons. cwts. qrs. lbs.*)	1 1 3 13	0 14 3 1	0 13 3 14	0 16 1 20	0 18 3 14	0 12 0 4	0 12 0 5	5 9 3 15	0 1 2 8
Oilcake (cotton cake)	(*ditto*)	0 0 1 2	0 0 1 2	0 0 1 2	0 0 1 2	0 0 1 2	0 0 1 2	0 0 1 2	0 1 3 14	0 0 0 3

Yield of Milk, &c.																													
	1	Cross short-horn	Aged	Mar. 10	1,182	17	0	13	2	17	0	11	4	16	11	11	10	17	10	12	15	16	12	11	6	16	0	11	0	202	4	28	14
	2	Cross short-horn	8	June 15	1,384	21	2	13	9	20	7	13	5	21	4	14	4	22	1	14	14	21	2	13	8	20	8	13	6	244	14	35	0
	3	Cross short-horn	6	Feb. 20	1,182	12	14	10	0	13	4	9	10	13	0	9	12	12	13	10	2	13	0	10	3	13	12	9	1	160	15	23	0
	4	Cross short-horn	7	Feb. 15	1,070	14	11	10	0	14	0	9	2	13	10	9	10	13	8	10	8	13	12	9	7	14	0	8	6	165	13	23	11
	5	Ayrshire - -	8	Feb. 22	1,019	13	6	8	11	13	7	6	10	12	0	8	2	11	6	7	14	11	6	8	5	11	2	7	0	138	15	19	14
	6	Cross short-horn	6	April 14	1,048	19	4	11	3	19	0	10	10	19	1	10	11	19	12	12	3	19	7	11	3	18	8	10	2	20	6	10	14	212	4	30	5
	7	Mongrel - -	Aged	April 12	884	15	0	8	5	15	2	8	4	14	2	9	0	14	0	9	4	15	8	8	2	14	10	8	3	17	1	9	6	165	15	23	11
	8	Cross short-horn	6	April 16	1,140	11	10	9	1	11	12	9	6	11	0	9	4	10	8	10	8	12	11	10	0	12	0	9	4	12	8	10	6	149	14	21	7
	9	Cross short-horn	7	April 13	1,040	16	1	12	3	16	3	12	10	18	2	10	12	17	10	14	11	18	14	11	15	19	10	10	7	19	0	12	9	210	11	30	1
	10	Half short-horn	8	April 25	1,260	24	4	14	3	23	0	14	4	22	6	15	4	22	2	15	7	23	0	13	6	22	2	13	4	23	10	15	4	261	8	37	6
				Totals	11,209	165	4	110	5	162	13	105	1	161	4	108	5	161	6	118	6	165	8	107	7	162	4	100	1	174	7	110	10	1,913	1		
				Means	1,121	16	8	11	1	16	5	10	8	16	2	10	13	16	2	11	13	16	9	10	12	16	4	10	0	17	7	11	1	191	5	27	5

Five Cows.—Unsewaged or Sewaged Italian Rye Grass.

Food consumed.		Rye Plots2 & 3,Crop 4.	Rye, Plot 2, Crop 4.	Rye, Plot 2, Crop 4, & Plot 0†, Crop 3.	Rye, Plot 0†, Crop 3.	Rye, Plot 0†, Crop 3.	Rye, Plot 0†, Crop 3.	Rye, Plot 0†, Crop 3,		
Grass	From which Field, Plot, and Crop									
	Quantities weighed (*tons. cwts. qrs. lbs.*)	0 7 1 9	0 4 1 11	0 4 2 2½	0 4 1 25½	0 6 1 17½	0 2 2 19½	0 2 2 22	1 12 1 23	0 0 3 20
Oilcake (cotton-cake)	(*ditto*)	0 0 0 15	0 0 0 15	0 0 0 15	0 0 0 15	0 0 0 15	0 0 0 15	0 0 0 15	0 0 3 21	0 0 0 3

Yield of Milk, &c.																													
	1	Cross short-horn	Aged	April 20	1,150	23	12	14	12	25	11	14	6	24	0	13	2	23	10	14	1	22	4	12	8	20	9	13	7	23	8	11	4	256	14	36	11
	2	Ayrshire - -	6	Mar. 15	922	19	10	11	6	18	8	12	7	17	10	11	8	17	12	12	0	17	4	10	13	16	14	11	12	18	6	9	9	205	7	29	6
	3	Cross short-horn	Aged	Mar. 1	1,145	15	8	9	12	16	10	9	7	16	1	9	7	14	4	4	10	15	8	7	7	15	12	9	2	15	14	8	4	167	10	23	15
	4	Cross short-horn	Aged	April 15	1,271	21	12	14	8	21	14	13	2	20	15	13	7	20	4	13	0	20	0	12	11	20	6	14	8	18	12	10	11	236	14	33	13
	5	Cross short horn	6	Jan. 2	1,195	12	10	7	3	12	7	8	0	13	0	7	0	12	12	8	0	13	12	7	5	13	7	8	1	14	15	8	0	146	14	21	0
				Totals	5,684	93	4	57	9	95	2	57	6	92	0	54	8	88	10	51	11	88	12	51	12	87	0	56	14	91	7	47	12	1,013	11		
				Means	1,137	18	10	11	8	19	0	11	8	18	6	10	14	17	12	10	6	17	12	10	6	17	6	11	6	18	5	9	9	202	12	28	15

Detailed Record of Food consumed, and Milk yielded, by Cows fed on Unsewaged and Sewaged Meadow Grass, and on Italian Rye Grass, with Oilcake in addition.
Third Season, 1863; 7 days.—August 18 to August 24.

					Tuesday.	Wednesday.	Thursday.	Friday.	Saturday.	Sunday.	Monday.	Total in 7 days.	Per head per day.
Five Cows.—Unsewaged Meadow Grass. *a*													
Food consumed.	Grass — From which Field, Plot, and Crop				* Rye, Crop 3.	* Rye, Crop 3.	* Rye, Crop 3.	* Rye, Crop 3.	* Rye, Crop 3.	* Rye, Crop 3.	* Rye, Crop 3.	—	—
	Grass — Quantities weighed (*tons. cwts. qrs. lbs.*)				0 2 0 9	0 3 0 5	0 4 0 12	0 1 3 6	0 2 0 3	0 2 0 25	0 2 0 25	0 17 2 1	0 0 2 0
	Oilcake (cotton-cake) — (*ditto*)				0 0 0 15	0 0 0 15	0 0 0 15	0 0 0 15	0 0 0 15	0 0 0 15	0 0 0 15	0 0 3 21	0 0 0 3
Yield of Milk, &c.	Cows. Nos.	Breed.	Years old.	Dates of Calving.	Weights (Aug. 17) *lbs.*	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	—	—
						lbs. *ozs.*	*lbs.* *ozs.*	*lbs.* *ozs.*	*lbs.* *ozs.*	*lbs.* *ozs.*	*lbs.* *ozs.*	*lbs.* *ozs.*	*lbs.* *ozs.*	*lbs.* *ozs.*	*lbs.* *ozs.*	*lbs.* *ozs.*	*lbs.* *ozs.*	*lbs.* *ozs.*	*lbs.* *ozs.*
	1	Cross short horn	Aged	May 1	1,176	21 6	13 4	22 1	14 2	21 14	14 0	22 0	13 13	22 7	12 13	22 0	12 6	247 1	35 5
	2	Cross short-horn	6	Feb. 15	1,253	14 0	8 6	14 6	8 3	13 6	9 5	13 8	8 13	14 4	7 7	13 6	8 6	154 8	22 1
	3	Cross short-horn	3	April 13	878	15 12	9 7	16 0	10 3	16 6	9 6	16 0	9 6	16 6	9 9	16 1	8 14	178 2	25 7
	4	Cross short-horn	8	May 20	1,118	24 6	16 5	25 8	15 7	26 6	16 5	25 0	15 13	24 14	17 10	26 0	13 7	289 5	41 5
	5	Cross short-horn	7	April 17	1,194	18 0	11 1	18 6	11 0	18 2	11 0	18 0	10 6	18 1	10 8	18 9	9 14	200 13	28 11
				Totals	5,619	93 8	58 7	96 5	58 15	96 2	60 0	94 8	58 3	96 0	57 15	95 5	53 9	96 12	54 4	1,069 13	—
				Means	1,124	18 11	11 11	19 4	11 13	19 4	12 0	18 14	11 10	19 3	11 9	19 1	10 11	19 6	10 14	213 15	30 9
Ten Cows.—Sewaged Meadow Grass.													
Food consumed.	Grass — From which Field, Plot, and Crop				Ten-acre, Plot 4, Crop 3.	Ten-acre, Plot 4, Crop 3.	Ten-acre, Plot 4, Crop 3.	Ten-acre, Plot 4, Crop 3.	Ten-acre, Plot 4, Crop 3.	Ten-acre, Plot 4, Crop 3.	Ten-acre, Plot 4, Crop 3.	—	—
	Grass — Quantities weighed (*tons. cwts. qrs. lbs.*)				0 15 0 3	0 15 0 19	0 16 0 16	0 16 0 18	0 16 1 24	0 15 2 17	0 15 2 23	5 10 1 8	0 1 2 8
	Oilcake (cotton-cake) — (*ditto*)				0 0 1 2	0 0 1 2	0 0 1 2	0 0 1 2	0 0 1 2	0 0 1 2	0 0 1 2	0 1 3 14	0 0 0 3
Yield of Milk, &c.	1	Cross short-horn	Aged	Mar. 10	1,182	16 4	11 12	16 0	12 7	17 2	12 3	16 1	12 4	15 12	10 6	17 2	11 0	196 15	28 0
	2	Cross short-horn	8	June 15	1,384	21 2	13 1	20 8	13 4	20 8	13 7	20 4	13 6	20 0	12 7	18 4	13 14	234 5	33 7
	3	Cross short-horn	6	Feb. 20	1,182	13 5	10 2	12 9	9 10	13 10	9 4	12 14	9 14	12 11	9 12	12 14	8 6	152 11	22 7
	4	Cross short-horn	7	Feb. 15	1,670	14 12	9 14	15 10	9 4	14 2	9 2	14 0	10 1	14 14	9 6	12 0	9 7	164 12	23 8
	5	Ayrshire —	8	Feb. 22	1,019	11 8	8 11	12 11	8 7	12 3	9 0	12 6	8 1	13 1	8 3	13 2	8 0	147 5	21 1
	6	Cross short-horn	6	April 14	1,048	19 0	11 5	18 14	11 5	17 12	11 1	19 0	11 9	18 0	12 0	18 10	10 8	208 8	29 13
	7	Mongrel —	Aged	April 12	884	16 1	9 1	15 11	8 11	14 14	10 4	15 4	8 14	15 4	8 15	14 14	8 7	168 8	24 1
	8	Cross short-horn	6	April 16	1,140	11 12	9 8	10 0	9 8	12 4	9 4	12 10	9 2	12 8	9 14	13 4	9 0	152 2	21 8
	9	Cross short-horn	7	April 13	1,040	20 3	11 10	18 1	13 12	18 0	12 8	17 4	12 10	16 14	13 5	14 6	14 0	211 10	30 4
	10	Half short-horn	8	April 25	1,260	21 4	16 4	20 11	15 1	21 2	14 12	21 12	14 12	21 8	13 4	20 12	12 10	247 11	35 6
				Totals	11,209	165 3	111 4	160 11	111 5	161 9	110 13	161 7	110 9	160 8	107 8	155 4	105 4	161 15	102 13	1,886 1	—
				Means	1,121	16 8	11 2	16 1	11 2	16 3	11 1	16 2	11 1	16 1	10 12	15 8	10 9	16 3	10 5	188 10	26 15
Five Cows.—Unsewaged or Sewaged Italian Rye Grass.													
Food consumed.	Grass — From which Field, Plot, and Crop				Rye, Plot 0†, Crop 3.	Rye, Plot 0†, Crop 3.	Rye, Plot 0†, Crop 3.	Rye, Plot 0†, Crop 3.	Rye, Plot 0†, Crop 3.	Rye, Plot 0†, Crop 3.	Rye, Plot 0†, Crop 3.	—	—
	Grass — Quantities weighed (*tons. cwts. qrs. lbs.*)				0 4 2 17½	0 4 2 15½	0 5 1 21	0 4 2 7½	0 4 0 14½	0 3 0 5½	0 3 0 8	1 9 2 5½	0 0 3 11
	Oilcake (cotton-cake) — (*ditto*)				0 0 0 15	0 0 0 15	0 0 0 15	0 0 0 15	0 0 0 15	0 0 0 15	0 0 0 15	0 0 3 21	0 0 0 3
Yield of Milk, &c.	1	Cross short-horn	Aged	April 20	1,150	21 12	13 7	22 11	12 11	21 12	13 5	21 2	13 4	20 12	15 5	21 8	12 6	23 7	10 12	244 2	34 14
	2	Ayrshire —	6	Mar. 15	922	17 10	11 10	17 7	10 8	18 4	10 15	17 9	11 8	18 0	10 1	18 5	10 11	17 12	9 6	199 3	28 7
	3	Cross short-horn	Aged	Mar. 1	1,146	15 13	9 4	15 12	9 4	15 12	9 4	15 10	9 7	16 4	9 8	15 3	9 6	16 10	8 5	175 6	25 1
	4	Cross short-horn	Aged	April 15	1,271	19 14	11 12	19 9	12 12	19 9	12 11	20 6	10 9	18 7	11 11	21 5	11 4	20 10	11 13	222 4	31 12
	5	Cross short-horn	6	Jan. 2	1,195	14 0	8 1	13 13	8 9	13 12	8 13	13 6	8 3	12 0	8 11	12 4	8 2	13 10	8 6	151 10	21 11
				Totals	5,684	89 1	54 2	89 4	53 12	89 1	55 0	87 10	52 15	85 7	55 4	88 9	51 13	92 1	43 10	992 9	—
				Means	1,137	17 13	10 13	17 14	10 12	17 13	11 0	17 8	10 9	17 1	11 1	17 11	10 6	18 7	9 12	198 8	28 6

* Not experimental.

† Unmeasured land, designated Plot 0 when unsewaged.

a Other grass was given when unsewaged meadow grass was not available.

Table X.—*continued.*

Detailed Record of Food consumed, and Milk yielded, by Cows fed on Unsewaged and Sewaged Meadow Grass, and on Italian Rye Grass, with Oilcake in addition.
Third Season, 1863; 7 days.—August 25 to August 31.

						Tuesday.		Wednesday.		Thursday.		Friday.		Saturday.		Sunday.		Monday.		Total in 7 days.	Per head per day.
Five Cows.—Unsewaged Meadow Grass. *a*																					
Food consumed.	Grass	From which Field, Plot, and Crop				Rye, * Crop 3.		Rye, * Crop 3.		Rye, * Crop 3.		Rye, * Crop 3.		Rye, * Crop 3.		Rye, * Crop 3.		Rye, * Crop 3.		—	—
		Quantities weighed (*tons. cwts. qrs. lbs.*)				0 1 2 24		0 3 3 3		0 2 2 23		0 2 0 5		0 2 2 11		0 1 1 20		0 1 1 20		0 15 2 22	0 0 1 22
	Oilcake (cotton-cake)				(*ditto*)	0 0 0 15		0 0 0 15		0 0 0 15		0 0 0 15		0 0 0 15		0 0 0 15		0 0 0 15		0 0 3 21	0 0 0 3
Yield of Milk, &c.	Cows. Nos.	Breed.	Years old.	Dates of Calving.	Weights (Aug. 17) *lbs.*	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	—	—
						lbs. ozs.	*lbs. ozs.*	*lbs. ozs.*	*lbs. ozs.*	*lbs. ozs.*	*lbs. ozs.*	*lbs. ozs.*	*lbs. ozs.*	*lbs. ozs.*	*lbs. ozs.*	*lbs. ozs.*	*lbs. ozs.*	*lbs. ozs.*	*lbs. ozs.*	*lbs. ozs.*	*lbs. ozs.*
	1	Cross short-horn	Aged	May 1	1,176	20 12	13 5	21 2	13 1	21 12	12 4	21 2	13 6	21 6	11 14	21 0	13 7	21 4	11 10	237 5	33 14
	2	Cross short-horn	6	Feb. 15	1,253	12 11	7 0	12 7	7 6	12 11	8 6	11 0	7 14	11 10	6 4	10 8	7 11	11 0	7 14	134 6	19 3
	3	Cross short-horn	3	April 13	878	16 0	10 0	16 11	10 3	16 3	9 0	15 1	8 15	14 14	8 10	15 4	9 2	15 6	9 1	174 6	24 15
	4	Cross short-horn	8	May 20	1,118	24 10	16 1	25 2	16 6	25 4	16 11	24 0	15 4	24 0	15 9	24 14	13 10	24 7	14 10	280 8	40 1
	5	Cross short-horn	7	April 17	1,194	17 12	10 0	17 11	10 12	18 5	10 8	16 2	9 2	16 13	8 12	17 0	9 0	16 11	9 15	188 7	26 15
				Totals	5,619	91 13	56 6	93 1	57 12	94 3	56 13	87 5	54 9	88 11	51 1	88 10	52 14	88 12	53 2	1,015 0	—
				Means	1,124	18 6	11 4	18 10	11 9	18 13	11 6	17 7	10 15	17 12	10 3	17 12	10 9	17 12	10 10	203 0	29 0
Ten Cows.—Sewaged Meadow Grass.																					
Food consumed.	Grass	From which Field, Plot, and Crop				Ten-acre, Plot 3, Crop 3.		Ten-acre, Plot 3, Crop 3.		Ten-acre, Plot 3, Crop 3.		Ten-acre, Plot 3, Crop 3.		Ten-acre, Plot 3, Crop 3.		Ten-acre, Plot 3, Crop 3.		Ten-acre, Plot 3, Crop 3.		—	—
		Quantities weighed (*tons. cwts. qrs. lbs.*)				0 14 2 5		0 12 1 11		0 15 1 21		1 0 0 1		0 15 1 27		0 17 0 25		0 17 0 26		5 12 1 4	0 1 2 12
	Oilcake (cotton-cake)				(*ditto*)	0 0 1 2		0 0 1 2		0 0 1 2		0 0 1 2		0 0 1 2		0 0 1 2		0 0 1 2		0 1 3 14	0 0 0 3
Yield of Milk, &c.,	1	Cross short-horn	Aged	Mar. 10	1,182	15 0	10 1	15 2	10 14	15 12	11 6	15 10	10 8	15 6	11 13	16 0	10 8	15 7	10 5	183 12	26 4
	2	Cross short-horn	8	June 15	1,384	16 10	11 8	18 1	12 11	20 0	12 12	18 4	12 10	18 7	11 12	19 6	11 8	19 2	12 6	215 1	30 12
	3	Cross short-horn	6	Feb. 20	1,182	12 14	9 6	12 5	9 9	12 6	9 0	12 6	9 10	13 4	9 10	12 13	9 0	12 1	9 0	153 4	21 14
	4	Cross short-horn	7	Feb. 15	1,070	13 6	8 5	12 10	9 8	14 2	9 4	13 12	9 6	12 11	9 7	14 6	8 0	13 12	8 12	157 5	22 8
	5	Ayrshire – –	8	Feb. 22	1,019	12 2	7 13	12 6	8 1	12 14	9 3	12 5	8 12	14 8	8 10	13 0	10 0	12 6	8 11	150 11	21 8
	6	Cross short-horn	6	April 14	1,048	16 10	9 12	16 4	11 4	18 12	11 0	18 6	10 8	18 12	10 9	18 12	10 6	18 3	10 0	199 2	28 7
	7	Mongrel – –	Aged	April 12	884	12 7	7 12	14 3	7 9	13 9	7 15	13 3	8 0	12 9	8 2	11 3	7 8	12 6	8 0	144 6	20 10
	8	Cross short horn	6	April 16	1,140	12 0	8 10	11 0	9 6	11 6	9 8	11 0	8 14	10 11	7 12	14 2	7 14	12 4	7 11	142 2	20 5
	9	Cross short-horn	7	April 13	1,040	16 2	12 9	15 6	11 4	17 10	9 4	17 0	10 12	16 6	11 2	17 3	8 14	16 6	10 10	190 8	27 3
	10	Half short-horn	8	April 25	1,260	19 5	12 4	19 7	13 10	20 4	14 8	18 10	13 6	20 4	12 12	20 0	12 11	20 5	13 4	230 10	32 15
				Totals	11,209	146 8	98 0	146 12	103 12	156 11	103 12	150 8	102 6	152 14	101 9	156 13	96 5	152 4	98 11	1,766 13	—
				Means	1,121	14 10	9 13	14 11	10 6	15 11	10 6	15 1	10 4	15 5	10 2	15 11	9 10	15 3	9 14	176 11	25 4
Five Cows.—Unsewaged or Sewaged Italian Rye Grass.																					
Food consumed.	Grass.	From which Field, Plot, and Crop				Rye, Plot 2, Crop 4.		Rye, Plot 2, Crop 4.		Rye, Plot 2, Crop 4.		Rye, Plot 2, Crop 4.		Rye, Plot 2, Crop 4.		Rye, * Crop 3.		Rye, * Crop 3.		—	—
		Quantities weighed (*tons. qrs. cwts. lbs.*)				0 2 2 20		0 5 2 15		0 4 2 23		0 6 3 15		0 1 3 15		0 3 0 24		0 3 0 24		1 8 0 24	0 0 3 6
	Oilcake (cotton-cake)				(*ditto*)	0 0 0 15		0 0 0 15		0 0 0 15		0 0 0 15		0 0 0 15		0 0 0 15		0 0 0 15		0 0 3 21	0 0 0 3
Yield of Milk, &c.	1	Cross short-horn	Aged	April 20	1,150	20 7	12 4	22 3	12 3	23 4	12 9	23 2	12 9	22 0	13 3	20 15	11 4	21 0	11 15	239 3	34 3
	2	Ayrshire – –	6	Mar. 15	922	18 6	10 1	17 8	10 10	17 4	11 7	18 0	11 3	17 5	11 6	17 6	9 1	16 7	10 12	197 1	28 2
	3	Cross short-horn	Aged	Mar. 1	1,146	15 0	8 11	15 3	9 9	16 3	9 9	16 5	9 12	15 6	9 12	15 3	9 3	14 7	9 3	174 1	24 14
	4	Cross short-horn	Aged	April 15	1,271	20 4	11 2	20 15	14 0	20 12	12 8	21 2	14 4	20 2	13 1	20 10	13 13	20 14	12 2	235 9	33 10
	5	Cross short-horn	6	Jan. 2	1,195	12 2	7 7	11 14	8 8	12 3	7 8	12 4	7 12	11 10	7 13	11 8	7 2	12 7	8 5	138 7	19 13
				Totals	5,684	86 3	49 9	87 11	55 5	89 10	53 9	90 13	55 13	86 7	55 8	85 15	50 6	85 3	52 5	984 5	—
				Means	1,137	17 4	9 15	17 9	11 1	17 15	10 11	18 2	11 3	17 5	11 2	17 3	10 1	17 0	10 7	196 14	28 2

a Other grass was given when unsewaged meadow grass was not available.

* Not experimental.

Detailed Record of Food consumed, and Milk yielded, by Cows fed on Unsewaged and Sewaged Meadow Grass, and on Italian Rye Grass, with Oilcake in addition.
Third Season, 1863; 7 days.—September 1 to September 7.

					Tuesday.		Wednesday.		Thursday.		Friday.		Saturday.		Sunday.		Monday.		Total in 7 days.	Per head per day.
Five Cows.—Unsewaged Meadow Grass. *a*																				
Food consumed.	Grass	From which Field, Plot, and Crop			Rye, Crop 3*.		Rye, Crop 3*.		Rye, Crop 3*.		Rye, Crop 3*.		Rye, Crop 3*.		Rye, Crop 3*.		Rye, Crop 3*.			
		Quantities weighed (*tons. cwts. qrs. lbs.*)			0 4 3 0		0 2 0 13		0 2 2 22		0 2 3 12		0 2 2 19		0 3 3 5		0 3 3 6		1 2 2 21	0 0 2 17
	Oilcake (cotton-cake)	(*ditto*)			0 0 0 15		0 0 0 15		0 0 0 15		0 0 0 15		0 0 0 15		0 0 0 15		0 0 0 15		0 0 3 21	0 0 0 3
Yield of Milk, &c.	Cows. Nos.	Breed.	Years old.	Dates of Calving.	Weights (Aug. 17). *lbs.*		A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.		
							lbs. ozs.	*lbs. ozs.*	*lbs. ozs.*	*lbs. ozs.*	*lbs. ozs.*	*lbs. ozs.*	*lbs. ozs.*	*lbs. ozs.*	*lbs. ozs.*	*lbs. ozs.*	*lbs. ozs.*	*lbs. ozs.*	*lbs. ozs.*	*lbs. ozs.*
	1	Cross short-horn	Aged	May 1	1,176		20 4	13 13	21 6	11 4	20 8	12 4	19 6	13 6	20 12	13 6	21 4	12 14	232 15	33 4
	2	Cross short-horn	6	Feb. 15	1,253		12 2	6 11	12 0	5 11	10 0	7 8	10 0	6 6	12 12	7 5	11 0	6 12	127 7	18 3
	3	Cross short-horn	3	April 13	878		14 2	9 1	14 14	8 6	14 0	8 15	15 12	9 10	15 4	9 3	15 0	8 8	165 6	23 10
	4	Cross short-horn	8	May 20	1,113		22 13	14 10	23 2	10 10	22 3	12 12	21 4	16 7	21 12	14 4	22 4	14 10	252 15	36 2
	7	Cross short-horn	7	April 17	1,194		16 12	10 5	16 4	9 2	16 1	9 6	17 0	11 1	16 15	12 8	16 12	10 1	188 8	26 15
				Totals	5,619		86 1	54 8	87 10	45 1	82 12	50 13	83 6	56 14	87 7	56 10	86 4	52 13	967 3	
				Means	1,124		17 3	10 14	17 8	9 0	16 9	10 3	16 11	11 6	17 8	11 5	17 4	10 9	193 7	27 10
Ten Cows.—Sewaged Meadow Grass.																				
Food consumed.	Grass	From which Field, Plot, and Crop			Five-acre, Plot 4, Crop 4.		Five-acre, Plot 4, Crop 4.		Ten acre, Plot 4, Crop 4.		Five-acre, Plot 3, Crop 3.		Five-acre, Plot 3, Crop 3.		Ten-acre, Plot 3, Crop 3.		Ten-acre, Plot 3, Crop 3.			
		Quantities weighed (*tons. cwts. qrs. lbs.*)			0 17 0 10		0 18 1 14		0 12 1 20		0 13 3 9		1 6 0 17		0 12 1 2		0 12 1 8		5 12 1 24	0 1 2 12
	Oilcake (cotton-cake)	(*ditto*)			0 0 1 2		0 0 1 2		0 0 1 2		0 0 1 2		0 0 1 2		0 0 1 2		0 0 1 2		0 1 3 14	0 0 0 3
Yield of Milk, &c.	1	Cross short-horn	Aged	Mar. 10	1,182		15 9	10 0	14 12	10 7	15 0	10 4	15 1	11 14	14 14	11 2	15 8	9 10	14 0	9 10	177 11	25 6
	2	Cross short-horn	8	June 15	1,384		18 2	12 6	16 15	12 10	18 4	12 2	19 8	13 2	19 12	12 12	18 14	11 7	19 2	11 14	216 14	31 0
	3	Cross short-horn	6	Feb. 20	1,182		12 7	8 8	12 6	8 6	12 3	9 12	12 12	10 3	13 2	9 9	12 7	8 0	12 10	8 7	150 12	21 9
	4	Cross short-horn	7	Feb. 15	1,070		13 8	9 0	12 1	7 14	12 0	8 8	13 0	9 0	13 12	8 8	12 4	7 4	12 4	8 3	147 2	21 0
	5	Ayrshire – –	8	Feb. 22	1,019		13 0	8 6	12 0	8 1	11 12	7 8	11 12	8 8	12 7	8 10	12 2	7 0	12 0	7 4	140 6	20 1
	6	Cross short-horn	6	April 14	1,048		18 4	10 15	18 7	10 14	18 12	10 13	19 1	10 15	19 8	11 6	18 0	10 2	18 12	11 0	206 13	29 9
	7	Mongrel – –	Aged	April 12	884		12 6	7 8	11 15	6 8	12 2	7 8	12 10	7 13	12 8	7 10	13 0	7 1	11 12	7 0	137 5	19 10
	8	Cross short-horn	6	April 16	1,140		11 0	9 10	10 14	7 12	10 0	7 11	9 0	8 5	10 6	8 9	10 8	7 5	11 0	7 6	129 6	18 8
	9	Cross short-horn	7	April 13	1,040		14 1	11 3	15 0	11 0	14 1	10 8	14 14	9 4	15 0	11 10	14 6	10 4	15 12	9 12	176 11	25 4
	10	Half short-horn	8	April 25	1,360		21 6	13 0	20 1	13 0	20 14	14 6	20 14	13 11	20 7	13 10	20 2	12 0	21 14	11 10	236 15	33 14
				Totals	11,209		149 11	100 8	144 7	96 8	145 0	99 0	148 8	102 11	151 12	103 6	147 3	90 1	149 2	92 2	1,719 15	
				Means	1,121		15 0	10 1	14 7	9 10	14 8	9 14	14 14	10 4	15 3	10 5	14 12	9 0	14 15	9 3	172 0	24 9
Five Cows.—Unsewaged or Sewaged Italian Rye Grass.																				
Food consumed.	Grass	From which Field, Plot, and Crop			Rye, Plot 3, Crop 5.		Rye, Plot 3, Crop 5.		Rye, Plot 3, Crop 5.		Rye, Plot 3, Crop 5.		Rye, Plot 3, Crop 5.		Rye, Plot 3, Crop 5.		Rye, Plot 3, Crop 5.			
		Quantities weighed (*tons. cwts. qrs. lbs.*)			0 8 1 10		0 4 0 11		0 4 2 23		0 5 0 15		0 5 3 5		0 4 2 11		0 4 2 17		1 17 1 8	0 1 0 7
	Oilcake (cotton-cake)	(*ditto*)			0 0 0 15		0 0 0 15		0 0 0 15		0 0 0 15		0 0 0 15		0 0 0 15		0 0 0 15		0 0 3 21	0 0 0 3
Yield of Milk, &c.	1	Cross short-horn	Aged	April 20	1,150		21 1	11 13	21 6	11 2	20 14	12 9	21 0	13 8	20 12	9 2	20 4	11 10	20 12	10 9	226 6	32 5
	2	Ayrshire – –	6	Mar. 15	922		15 8	11 3	17 8	7 14	14 6	10 4	18 10	12 2	16 8	9 10	17 8	9 10	15 0	9 2	184 13	26 6
	3	Cross short-horn	Aged	Mar. 1	1,146		18 6	8 9	15 12	9 9	16 15	9 4	14 6	9 14	14 10	8 12	15 10	9 15	17 10	8 6	177 10	25 6
	4	Cross short-horn	Aged	April 15	1,271		20 11	11 14	20 7	12 1	19 0	12 14	19 10	13 14	20 1	11 5	20 6	12 1	21 5	10 4	225 13	32 4
	5	Cross short-horn	6	Jan. 2	1,195		12 5	7 10	13 4	7 7	13 2	8 11	13 11	8 3	12 14	7 11	13 4	8 9	14 0	8 6	149 1	21 5
				Totals	5,684		87 15	51 1	88 5	48 1	84 5	53 10	87 5	57 9	84 13	46 8	87 0	51 13	88 11	46 11	963 11	
				Means	1,137		17 9	10 3	17 11	9 10	16 14	10 12	17 7	11 8	16 15	9 5	17 7	10 6	17 12	9 5	192 12	27 9

a Other grass was given when unsewaged meadow grass was not available.

* Not experimental.

Table X.—*continued.*

Detailed Record of Food consumed, and Milk yielded, by Cows fed on Unsewaged and Sewaged Meadow Grass, and on Italian Rye Grass, with Oilcake in addition.
Third Season, 1863; 7 days.—September 8 to September 14.

Five Cows.—Unsewaged Meadow Grass. *a*

Food consumed.			Tuesday.	Wednesday.	Thursday.	Friday.	Saturday.	Sunday.	Monday.	Total in 7 days.	Per head per day.
Grass	From which Field, Plot, and Crop –		* Rye, Crop 3.	Five-acre, Plot 0†, Crop 2.	Five-acre, Plot 0†, Crop 2.	Ten-acre, Plot 0†, Crop 2.	Ten-acre, Plot 0†, Crop 2.	Five-acre, Plot 0†, Crop 2.	Five-acre, Plot 0†, Crop 2.	—	—
	Quantities weighed (*tons. cwts. qrs. lbs.*) –		0 3 2 23	0 3 3 22‡	0 5 1 16‡	0 5 1 14	0 5 3 18‡	0 4 3 22	0 4 3 27	1 14 1 3‡	0 0 3 26
Oilcake (cotton-cake) –	(*ditto.*) –		0 0 0 15	0 0 0 15	0 0 0 15	0 0 0 15	0 0 0 15	0 0 0 15	0 0 0 15	0 0 3 21	0 0 0 3

Yield of Milk, &c.	Cows. Nos.	Breed.	Years old.	Dates of Calving.	Weights (Sept. 14) *lbs.*	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	—	—
						lbs. qrs.	*lbs. qrs.*	*lbs. qrs.*	*lbs. qrs.*	*lbs. qrs.*	*lbs. qrs.*	*lbs. qrs.*	*lbs. qrs.*	*lbs. qrs.*	*lbs. qrs.*	*lbs. qrs.*	*lbs. qrs.*	*lbs. qrs.*	*lbs. qrs.*	*lbs. qrs.*	*lbs. qrs.*
	1	Cross short-horn	Aged	May 1	1,186‡	21 4	13 3	20 8	12 8	21 0	13 2	20 15	11 8	21 4	12 10	20 11	11 5	21 10	12 4	235 12	6
	2	Cross short-horn		Feb. 15	1,274‡	10 14	8 1	11 10	7 10	11 8	7 11	12 0	7 0	11 12	7 6	11 6	7 12	13 0	7 15	135 9	6
	3	Cross short-horn		April 13	899‡	14 7	9 7	15 0	8 14	15 9	9 7	15 1	8 9	14 8	8 0	14 0	8 2	15 0	8 11	164 11	8
	4	Cross short-horn		May 20	1,146‡	20 1	15 8	22 10	14 11	22 10	15 10	22 7	14 14	23 4	14 14	22 4	14 10	23 2	15 0	261 9	37
	5	Cross short-horn		April 17	1,267‡	17 0	10 2	17 8	9 14	17 7	9 12	17 0	9 10	17 3	9 7	16 12	9 13	17 8	10 0	189 0	27
				Totals	5,772	83 10	56 5	87 4	53 9	88 2	55 10	87 7	51 9	87 15	52 5	85 1	51 10	90 4	53 14	984 9	—
				Means	1,154	16 12	11 4	17 7	10 12	17 10	11 2	17 8	10 5	17 9	10 7	17 0	10 5	18 1	10 13	196 15	28 2

Ten Cows.—Sewaged Meadow Grass.

Food consumed.			Five-acre, Plot 3, Crop 3.	Five-acre, Plot 4, Crop 4.	Five-acre, Plot 4, Crop 4.	Ten-acre, Plot 2. Crop 3.	Ten-acre, Plot 2. Crop 3.	Five-acre, Plot 2, Crop 3.	Five-acre, Plot 2, Crop 3,	—	—
Grass	From which Field, Plot, and Crop –										
	Quantities weighed (*tons. cwts. qrs. lbs.*) –		0 14 3 14	1 7 3 24	1 1 2 21	0 17 1 26	1 0 0 23	0 10 0 11	0 10 0 17	6 2 1 24	0 1 3 0
Oilcake (cotton-cake) –	(*ditto.*) –		0 0 1 2	0 0 1 2	0 0 1 2	0 0 1 2	0 0 1 2	0 0 1 2	0 0 1 2	0 1 3 14	0 0 0 3

Yield of Milk, &c.																					
	1	Cross short-horn	Aged	Mar. 10	1,208	14 8	10 10	14 10	10 13	16 0	10 8	15 10	9 3	14 8	10 0	14 7	10 10	16 9	10 2	178 2	25 7
	2	Cross short-horn	8	June 15	1,394	18 4	11 10	18 0	13 1	18 10	11 9	18 6	11 6	18 3	12 1	17 1	10 14	20 10	10 14	210 9	30 1
	3	Cross short-horn	6	Feb. 20	1,174	12 4	8 14	12 1	9 5	12 13	9 0	13 0	7 8	11 10	8 6	11 12	7 14	12 12	7 9	144 3	20 10
	4	Cross short-horn	7	Feb. 15	1,090	12 2	8 0	12 0	8 4	13 0	7 10	12 14	7 0	11 1	8 2	11 14	8 6	13 3	8 1	141 9	20 4
	5	Ayrshire – –	8	Feb. 22	1,025	11 11	7 8	11 10	8 5	12 0	8 3	12 0	7 6	11 12	8 1	11 4	7 8	12 13	7 0	137 1	19 9
	6	Cross short-horn	6	April 14	1,096	18 5	11 4	17 11	11 12	18 12	11 0	17 4	9 8	17 7	11 2	17 6	10 4	17 10	10 13	200 2	28 9
	7	Mongrel – –	Aged	April 12	892	11 0	7 14	12 0	7 2	12 10	7 1	12 0	7 6	12 10	7 5	12 0	7 0	12 6	5 14	134 4	19 3
	8	Cross short-horn	6	April 16	1,190	11 3	8 4	11 10	7 11	10 6	8 10	11 6	7 10	17 0	8 7	12 4	8 12	12 2	8 14	144 3	20 10
	9	Cross short-horn	7	April 18	1,087	15 1	10 0	14 12	12 7	15 11	9 6	16 7	9 2	16 5	9 5	15 11	10 2	16 3	10 10	181 2	25 14
	10	Half short-horn	8	April 25	1,278	20 4	13 0	20 6	13 10	20 12	14 8	20 2	12 6	20 0	13 2	20 8	12 4	20 2	11 10	232 10	33 4
				Totals	11,444	144 10	97 0	144 12	102 6	150 10	97 7	149 1	88 7	150 8	95 15	144 3	93 10	154 6	90 14	1,703 13	—
				Means	1,144	14 7	9 11	14 8	10 4	15 1	9 12	14 14	8 14	15 1	9 9	14 7	9 6	15 7	9 1	170 6	24 5

Five Cows.—Unsewaged or Sewaged Italian Rye Grass.

Food consumed.			Rye, Plots2&3, Crop5.	Rye, * Crop 3.	Rye, Plot 1, Crop 4.	Rye, Plot 1, Crop 4.	Rye, Plot 1, Crop 4.	Rye, * Crop 3.	Rye, * Crop 3.	—	—
Grass	From which Field, Plot, and Crop –										
	Quantities weighed (*tons. cwts. qrs. lbs.*) –		0 4 2 14	0 4 2 24‡	0 2 1 17‡	0 4 0 10	0 3 0 5	0 1 1 2	0 1 1 2	1 1 1 18‡	0 0 2 13
Oilcake (cotton-cake) –	(*ditto.*) –		0 0 0 15	0 0 0 15	0 0 0 15	0 0 0 15	0 0 0 15	0 0 0 15	0 0 0 15	0 0 3 21	0 0 0 3

Yield of Milk, &c.																					
	1	Cross short-horn	Aged	April 20	1,130‡	17 9	13 7	21 0	12 3	20 8	13 13	18 14	13 0	21 10	12 6	20 0	12 0	18 10	9 11	224 11	32 2
	2	Ayrshire – –	6	Mar. 15	932‡	16 3	10 10	17 5	10 9	17 10	11 14	17 5	10 13	17 15	10 0	16 2	10 1	15 10	8 9	190 10	27 4
	3	Cross short-horn	Aged	Mar. 1	1,169‡	15 0	9 11	16 0	10 11	14 12	11 9	14 12	9 4	14 14	9 6	14 2	8 8	14 12	7 12	170 8	24 9
	4	Cross short-horn	Aged	April 15	1,290‡	18 1	13 9	21 8	12 8	20 10	13 5	19 5	11 12	20 12	12 0	19 0	12 10	19 2	10 4	224 6	32 1
	5	Cross short-horn	6	Jan. 2	1,224‡	12 13	9 2	13 0	9 3	12 12	9 10	12 9	7 1	12 0	8 3	11 14	8 2	12 4	7 14	146 7	20 15
				Totals	5,754	79 10	56 7	88 13	55 2	86 4	59 10	82 13	51 14	87 3	51 15	81 2	51 5	80 6	44 2	956 10	—
				Means	1,151	15 15	11 5	17 12	11 0	17 4	11 15	16 9	10 6	17 7	10 6	16 4	10 4	16 1	8 13	191 5	27 5

* Not experimental.
† Unmeasured land, designated Plot 0 when unsewaged.
‡ In these cases the weights recorded are of an intermediate weighing taken on September 8.
§ 1 cwt. 2 qrs. 24 lbs. of this quantity came off Rye, Plot 2, Crop 5.
a Other grass was given when unsewaged meadow grass was not available.

Detailed Record of Food consumed, and Milk yielded, by Cows fed on Unsewaged and Sewaged Meadow Grass, and on Italian Rye Grass, with Oilcake in addition.
Third Season, 1863; 7 days.—September 15 to September 21.

					Tuesday.		Wednesday.		Thursday.		Friday.		Saturday.		Sunday.		Monday.		Total in 7 days.	Per head per day.
Five Cows.—Unsewaged Meadow Grass.																				
Food consumed.	Grass	From which Field, Plot, and Crop			Five-acre, Plot 0*, Crop 2.		Five-acre, Plot 0*, Crop 2.		Ten-acre, Plot 0*, Crop 2.		Ten-acre, Plot 0*, Crop 2.		Ten-acre, Plot 0*, Crop 2.		Ten-acre, Plot 1, Crop 2.		Ten-acre, Plot 1, Crop 2.		—	—
		Quantities weighed (*tons. cwts. qrs. lbs.*)			0 3 3 1½		0 5 3 8½		0 4 3 1		0 3 2 8		0 4 0 7		0 4 2 3½		0 4 2 6		1 11 0 7½	0 0 3 15
	Oilcake (3 parts cotton & 2 parts rape-cake)			(*ditto*)	0 0 0 25		0 0 0 25		0 0 0 25		0 0 0 25		0 0 0 25		0 0 0 25		0 0 0 25		0 1 2 7	0 0 0 5
Yield of Milk, &c.	Cows. Nos.	Breed.	Years old.	Dates of Calving.	Weights (Sept. 14) *lbs.*	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	—	—
						lbs. *qrs.*	*lbs.* *qrs.*	*lbs.* *qrs.*	*lbs.* *qrs.*	*lbs.* *qrs.*	*lbs.* *qrs.*	*lbs.* *qrs.*	*lbs.* *qrs.*	*lbs.* *qrs.*	*lbs.* *qrs.*	*lbs.* *qrs.*	*lbs.* *qrs.*	*lbs.* *qrs.*	*lbs.* *qrs.*	*lbs.* *qrs.*	*lbs.* *qrs.*
	1	Cross short-horn	Aged	May 1	1,199	21 6	13 6	22 0	11 12	21 10	12 7	20 7	13 2	20 4	13 1	21 12	11 12	21 4	12 2	236 5	33 12
	2	Cross short-horn	6	Feb. 15	1,268	12 10	8 10	12 1	7 5	11 13	7 10	12 8	7 6	12 14	7 1	11 14	6 11	12 0	6 11	137 2	19 9
	3	Cross short-horn	3	April 13	897	15 1	8 14	15 3	8 6	14 0	8 13	14 2	9 0	14 5	8 5	13 1	8 0	14 13	7 9	159 8	22 13
	4	Cross short-horn	8	May 20	1,141	21 8	16 1	24 13	12 12	22 14	14 10	22 0	15 10	23 5	14 9	22 4	14 10	21 6	13 5	259 11	37 2
	5	Cross short-horn	7	April 17	1,236	17 7	10 2	18 3	8 7	15 2	10 4	17 6	11 0	18 5	10 2	18 13	9 0	18 4	10 0	192 7	27 8
				Totals	5,741	88 0	57 1	92 4	48 10	85 7	53 12	86 7	56 2	89 1	53 2	87 12	50 1	87 11	49 11	985 1	—
				Means	1,148	17 10	11 6	18 7	9 12	17 1	10 12	17 4	11 4	17 13	10 10	17 9	10 0	17 9	9 15	197 0	28 2
Ten Cows.—Sewaged Meadow Grass.																				
Food consumed.	Grass	From which Field, Plot, and Crop			Five-acre, Plot 2, Crop 3.		Five-acre, Plot 4, Crop 4.		Five-acre, Plot 2, Crop 3.		Ten-acre, Plot 00*, Crop 3.		Ten-acre, Plot 2, Crop 3.		Ten-acre, Plot 2, Crop 3.		Ten-acre, Plot 2, Crop 3.		—	—
		Quantities weighed (*tons. cwts. qrs. lbs.*)			0 13 2 19		0 14 0 21		0 12 0 17		0 12 0 18		0 17 1 15		0 11 3 10		0 11 3 16		4 13 1 4	0 1 1 9
	Oilcake (3 parts cotton & 2 parts rape-cake)			(*ditto*)	0 0 1 22		0 0 1 22		0 0 1 23		0 0 1 22		0 0 1 22		0 0 1 22		0 0 1 22		0 3 0 14	0 0 0 5
Yield of Milk, &c.	1	Cross short-horn	Aged	Mar. 10	1,208	14 6	10 10	16 8	11 2	16 4	11 0	15 6	11 4	15 10	11 4	15 6	10 0	15 0	9 11	183 7	26 3
	2	Cross short-horn	8	June 15	1,394	17 0	12 11	19 0	12 2	18 0	12 8	18 3	12 6	18 1	12 6	18 2	10 12	18 10	11 6	211 3	30 3
	3	Cross short-horn	6	Feb. 20	1,174	11 14	9 2	12 10	8 10	12 1	8 10	12 4	9 5	12 2	8 12	11 6	7 8	11 14	7 13	143 15	20 9
	4	Cross short-horn	7	Feb. 15	1,099	12 7	9 4	14 0	8 8	12 7	8 12	14 3	9 14	14 0	9 8	14 5	8 10	14 0	8 3	158 1	22 9
	5	Ayrshire – –	8	Feb. 22	1,035	11 0	8 4	12 11	7 10	12 2	10 2	11 12	8 0	12 0	7 10	11 10	7 0	11 7	7 13	139 1	19 14
	6	Cross short-horn	6	April 14	1,096	16 10	11 13	19 3	11 6	18 5	7 15	18 8	11 14	17 12	11 8	18 6	11 8	18 0	9 10	202 4	28 14
	7	Mongrel – –	Aged	April 12	892	11 0	8 2	13 0	8 1	12 2	7 8	12 10	7 8	12 0	7 7	11 6	6 14	14 0	7 1	138 11	19 13
	8	Cross short-horn	6	April 16	1,190	11 14	8 15	11 6	7 0	11 4	8 10	11 0	8 8	10 14	8 13	10 11	7 7	10 11	8 8	135 9	19 6
	9	Cross short-horn	7	April 13	1,087	15 1	10 6	17 10	9 10	16 13	11 2	15 8	13 1	17 5	10 2	15 4	9 1	16 0	12 11	189 10	27 1
	10	Half short-horn	8	April 25	1,278	19 8	13 1	21 4	13 8	19 11	13 12	20 14	13 13	20 8	13 14	19 12	12 2	21 10	12 7	235 12	33 11
				Totals	11,444	140 12	102 4	157 4	97 9	148 15	99 15	150 4	105 9	150 4	101 4	146 4	90 14	151 4	95 3	1,737 9	—
				Means	1,144	14 1	10 4	15 12	9 12	14 14	10 0	15 0	10 9	15 1	10 2	14 10	9 1	15 2	9 8	173 12	24 13
Five Cows.—Unsewaged or Sewaged Italian Rye Grass.																				
Food consumed.	Grass	From which Field, Plot, and Crop			Rye, Plot 0*, Crop 4.		Rye, Plot 0*, Crop 4.		Rye, Plot 0*, Crop 4.		Rye, Plot 0*, Crop 4.		Rye, Plot 0*, Crop 4.		Rye, Plot 0*, Crop 4.		Rye, Plot 0*, Crop 4.		—	—
		Quantities weighed (*tons. cwts. qrs. lbs.*)			0 5 0 21		0 6 0 13		0 4 0 17		0 7 1 3½		0 5 3 7½		0 5 2 23½		0 5 3 0		2 0 0 3½	1 0 16
	Oilcake (3 parts cotton & 2 parts rape-cake)			(*ditto*)	0 0 0 25		0 0 0 25		0 0 0 25		0 0 0 25		0 0 0 25		0 0 0 25		0 0 0 25		0 1 2 7	0 0 5
Yield of Milk, &c.	1	Cross short-horn	Aged	April 20	1,121	17 12	12 10	23 3	11 8	22 10	11 12	21 4	14 1	20 0	13 4	19 7	10 8	19 10	11 8	229 1	32 12
	2	Ayrshire – –	6	Mar. 15	934	15 5	10 9	17 6	9 4	16 1	9 14	15 6	11 2	15 0	11 6	17 2	10 12	17 8	9 14	186 9	26 10
	3	Cross short-horn	Aged	Mar. 1	1,166	14 7	9 1	14 12	8 15	14 1	9 6	17 5	10 2	17 9	10 12	14 11	10 0	14 2	8 2	173 5	24 12
	4	Cross short-horn	Aged	April 15	1,295	18 5	12 4	19 8	11 10	18 12	12 0	19 0	12 14	19 0	13 8	20 9	11 4	20 0	11 14	220 8	31 8
	5	Cross short-horn	6	Jan. 2	1,234	11 10	8 2	12 2	8 8	11 10	8 6	13 6	8 11	12 7	8 14	14 0	7 6	12 10	7 12	145 8	20 13
				Totals	5,750	77 7	52 10	86 15	49 13	83 2	51 6	86 5	56 14	84 0	57 12	85 13	49 14	83 14	49 2	954 15	—
				Means	1,150	15 8	10 8	1 6	10 0	16 10	10 4	17 4	11 6	16 13	11 9	17 3	10 0	16 12	9 13	191 0	27 5

* Unmeasured land; designated Plot 0 when unsewaged, and Plot 00 when sewaged.

Table X.—*continued.*

Detailed Record of Food consumed, and Milk yielded, by Cows fed on Unsewaged and Sewaged Meadow Grass, and on Italian Rye Grass, with Oilcake in addition.
Third Season, 1863; 7 days.—September 22 to September 28.

						Tuesday.		Wednesday.		Thursday.		Friday.		Saturday.		Sunday.		Monday.		Total in 7 days.	Per head per day.
Five Cows.—Unsewaged Meadow Grass.																					
Food consumed.	Grass: From which Field, Plot, and Crop					Five-acre, Plot 0*, Crop 2.		Five-acre, Plot 1, Crop 2.		Five-acre, Plot 1, Crop 2.		Five-acre, Plot 1, Crop 2.		—		Ten-acre, Plot 1, Crop 2.		Ten-acre, Plot 1, Crop 2.		—	—
	Grass: Quantities weighed (*tons. cwts. qrs. lbs.*)					0 3 1 12		0 4 1 14½		0 2 3 10½		0 8 1 2		—		0 8 0 16		0 8 0 21		1 15 0 20	0 1 0 1
	Oilcake (3 parts cotton & 2 parts rape-cake) (*ditto*)					0 0 0 25		0 0 0 25		0 0 0 25		0 0 0 25		0 0 0 25		0 0 0 25		0 0 0 25		0 1 2 7	0 0 0 5
Yield of Milk, &c.	Cows. Nos.	Breed.	Years old.	Dates of Calving.	Weights (Sept. 14) *lbs.*	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	—	—
						lbs. ozs.	*lbs. ozs.*	*lbs. ozs.*	*lbs. ozs.*	*lbs. ozs.*	*lbs. ozs.*	*lbs. ozs.*	*lbs. ozs.*	*lbs. ozs.*	*lbs. ozs.*	*lbs. ozs.*	*lbs. ozs.*	*lbs. ozs.*	*lbs. ozs.*	*lbs.* *ozs.*	*lbs.* *ozs.*
	1	Cross short-horn	Aged	May 1	1,204†	20 8	12 12	21	13 13	20 12	11 15	21 6	13 7	20 8	12 12	20 4	11 0	20 6	12 14	233 13	33 6
	2	Cross short-horn	6	Feb. 15	1,272†	11 0	6 11	10 6	7 3	11 0	5 7	11 0	6 10	10 12	8 0	10 0	8 1	11 8	6 8	124 2	17 12
	3	Cross short-horn	3	April 13	889†	12 14	8 11	14 11	8 15	14 0	8 11	14 6	9 10	14 7	9 6	14 7	8 8	14 4	9 10	163 8	23 6
	4	Cross short-horn	8	May 20	1,098†	21 12	14 14	22 8	13 11	22 3	14 4	22 10	13 10	21 11	14 11	21 8	9 12	23 1	14 10	250 13	35 13
	5	Cross short-horn	7	April 17	1,244†	17 3	10 2	18 1	9 14	17 2	9 2	17 13	10 6	17 3	9 10	17 2	12 4	17 2	9 11	192 11	27 8
				Totals	5,707	84 5	53 2	87 2	53 8	85 1	49 7	87 3	53 11	84 9	54 7	83 5	49 9	86 5	53 5	964 15	—
				Means	1,141	16 14	10 10	17 7	10 11	17 0	9 14	17 7	10 12	16 15	10 14	16 10	9 15	17 4	10 11	193 0	27 9
Ten Cows.—Sewaged Meadow Grass.																					
Food consumed.	Grass: From which Field, Plot, and Crop					Five-acre, Plot 4, Crop 4.		Five-acre, Plot 4, Crop 4.		Five-acre, Plot 4, Crop 4.		Five-acre, Plot 4, Crop 4.		Ten-acre, Plot 2, Crop 3.		Ten-acre, Plot 2, Crop 3.		Ten-acre, Plot 2, Crop 3.		—	—
	Grass: Quantities weighed (*tons. cwts. qrs. lbs.*)					0 14 1 0		0 16 3 21		1 1 0 24		0 17 2 24		0 17 1 6		0 10 1 16		0 10 1 12		5 8 0 19	0 1 2 5
	Oilcake (3 parts cotton & 2 parts rape-cake) (*ditto*)					0 0 1 22		0 0 1 22		0 0 1 22		0 0 1 22		0 0 1 22		0 0 1 22		0 0 1 22		0 3 0 14	0 0 0 5
Yield of Milk, &c.	1	Cross short-horn	Aged	Mar. 10	1,208	15 0	10 3	14 15	10 12	15 0	10 3	14 12	10 12	14 8	10 13	14 2	9 10	15 1	10 7	176 2	25 3
	2	Cross short-horn	8	June 15	1,394	16 10	11 8	17 12	11 11	17 10	11 6	18 6	11 10	18 7	11 11	17 5	11 6	18 5	11 8	205 3	29 5
	3	Cross short-horn	6	Feb. 20	1,174	12 1	8 8	12 0	8 6	12 1	8 13	11 12	8 15	11 8	8 10	10 11	7 14	11 12	9 5	142 4	20 5
	4	Cross short-horn	7	Feb. 15	1,090	11 14	9 7	14 0	9 2	13 14	9 2	13 13	9 7	13 10	8 11	12 0	8 6	12 8	8 0	153 14	22 0
	5	Ayrshire - -	8	Feb. 22	1,035	11 0	7 0	10 11	7 12	10 13	7 5	11 6	8 4	11 8	7 10	10 12	6 10	11 4	7 3	129 2	18 7
	6	Cross short-horn	6	April 14	1,096	17 14	10 12	18 4	12 3	18 12	12 2	20 0	11 0	20 10	11 8	19 0	12 0	20 0	11 15	216 0	30 14
	7	Mongrel - -	Aged	April 12	892	11 12	6 15	11 6	6 6	11 0	6 7	11 2	6 4	10 9	6 8	10 0	6 6	11 10	7 0	123 5	17 10
	8	Cross short-horn	6	April 16	1,190	10 10	8 1	10 4	8 7	9 4	8 3	9 5	7 14	9 0	8 5	10 6	8 2	11 2	8 7	127 6	18 3
	9	Cross short-horn	7	April 18	1,087	15 8	10 3	17 1	10 7	16 2	10 5	15 11	11 10	14 11	11 13	15 7	9 14	14 6	11 8	184 10	26 6
	10	Half short-horn	8	April 25	1,278	21 11	11 15	20 5	14 6	20 2	13 2	21 2	13 9	20 10	13 13	19 11	11 15	21 4	10 13	234 6	33 8
				Totals	11,444	144 0	94 8	146 10	99 8	144 10	97 0	147 5	99 5	145 1	99 6	139 6	92 3	147 4	96 2	1,692 4	—
				Means	1,144	14 6	9 7	14 11	9 15	14 7	9 11	14 12	9 15	14 8	9 15	13 15	9 4	14 12	9 10	169 4	24 3
Five Cows.—Unsewaged or Sewaged Italian Rye Grass.																					
Food consumed.	Grass: From which Field, Plot, and Crop					Rye, Plot 0*, Crop 4.		Rye, Plot 2, Crop 5.		Rye, Plot 2, Crop 5.		‡ Rye, Crop 4,&c.		‡ Rye, Crop 4.		‡ Rye, Crop 4.		‡ Rye, Crop 4.		—	—
	Grass: Quantities weighed (*tons. cwts. qrs. lbs.*)					0 4 2 10½		0 4 2 9		0 4 2 5		0 4 0 6		0 3 2 10		0 3 2 21		0 3 2 21		1 8 3 7½	0 0 3 8
	Oilcake (3 parts cotton & 2 parts rape-cake) (*ditto*)					0 0 0 25		0 0 0 25		0 0 0 25		0 0 0 25		0 0 0 25		0 0 0 25		0 0 0 25		0 1 2 7	0 0 0 5
Yield of Milk, &c	1	Cross short-horn	Aged	April 20	1,121	20 3	12 0	20 0	12 4	19 14	13 1	19 10	12 6	20 6	12 12	18 7	13 9	18 6	11 4	224 2	32 0
	2	Ayrshire - -	6	Mar. 15	934	17 7	11 0	17 15	10 12	17 10	11 8	17 15	11 9	18 0	10 11	18 2	11 0	18 4	10 5	202 2	28 14
	3	Cross short-horn	Aged	Mar. 1	1,166	15 0	8 12	15 0	9 11	14 1	8 15	14 12	9 4	15 2	10 8	15 2	10 0	15 8	8 3	169 14	24 4
	4	Cross short-horn	Aged	April 15	1,295	19 2	12 4	18 10	12 9	17 4	12 4	18 2	11 12	17 10	9 13	17 11	11 4	16 6	9 4	203 15	29 2
	5	Cross short-horn	6	Jan. 2	1,234	12 8	8 12	13 4	9 0	12 12	8 10	12 4	9 0	12 11	8 10	13 3	8 2	10 12	7 10	147 2	21 0
				Totals	5,750	84 4	52 12	84 13	54 4	81 9	54 6	82 11	53 15	83 13	52 6	82 9	53 15	79 4	46 10	947 3	—
				Means	1,150	16 14	10 9	16 15	10 13	16 5	10 14	16 9	10 13	16 12	10 7	16 8	10 13	15 14	9 5	189 7	27 1

* Here omitted, the whole of Plot 0 when unsewaged.

† In these cases the weights recorded are of an intermediate weighing taken on September 28.

‡ Not experimental.

Detailed Record of Food consumed, and Milk yielded, by Cows fed on Unsewaged and Sewaged Meadow Grass, and on Italian Rye Grass, with Oilcake in addition.
Third Season, 1863; 7 days.—September 29 to October 5.

Five Cows.—Unsewaged Meadow Grass. *a*

						Tuesday.		Wednesday.		Thursday.		Friday.		Saturday.		Sunday.		Monday.		Total in 7 days.	Per head per day.
Food consumed.	Grass	From which Field, Plot, and Crop				Five-acre, Plot 3, Crop 4.		Five-acre, Plot 3, Crop 4.		Five-acre, Plot 3, Crop 4.		Ten-acre, Plot 4, Crop 4.		Ten-acre, Plot 4, Crop 4.		Ten-acre, Plot 4, Crop 4.		Ten-acre, Plot 4, Crop 4.		—	—
		Quantities weighed (*tons. cwts. qrs. lbs.*)				0 6 2 23		0 9 2 3		0 5 2 22		0 9 3 16		0 6 2 2		0 5 0 5		0 5 0 7		2 8 1 22	0 1 1 15
	Oilcake (3 parts cotton & 2 parts rape-cake)				(*ditto*)	0 0 0 25		0 0 0 25		0 0 0 25		0 0 0 25		0 0 0 25		0 0 0 25		0 0 0 25		0 1 2 7	0 0 0 5
Yield of Milk, &c.	Cows. Nos.	Breed.	Years old.	Dates of Calving.	Weights (Sept. 14) *lbs.*	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	—	—
						lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.
	1	Cross short-horn	Aged	May 1	1,204*	21 0	12 12	10 14	11 6	10 9	12 3	20 12	11 8	20 14	11 14	22 9	11 3	22 1	12 16	227 13	32 9
	2	Cross short-horn	6	Feb. 15	1,272*	10 12	6 4	11 0	6 12	10 11	7 7	10 10	6 5	11 0	6 6	10 8	7 1	10 11	6 1	121 8	17 6
	3	Cross short-horn	3	April 13	889*	16 2	8 13	14 1	8 0	15 7	9 6	15 10	8 12	15 2	9 2	16 15	8 4	15 0	8 1	168 11	24 2
	4	Cross short-horn	8	May 20	1,098*	21 14	16 14	23 10	14 12	22 14	16 0	24 8	13 8	23 0	16 8	24 0	14 2	23 15	12 0	287 9	38 3
	5	Cross short-horn	7	April 17	1,244*	17 2	9 4	17 3	9 1	18 0	10 10	17 0	10 10	16 15	10 4	18 10	9 12	17 0	8 2	189 9	27 1
				Totals	5,707	86 14	53 15	85 12	49 15	86 9	55 10	88 8	50 11	86 15	54 2	92 10	50 11	88 11	44 3	975 2	—
				Means	1,141	17 6	10 13	17 2	10 0	17 5	11 2	17 11	10 2	17 6	10 13	18 9	10 2	17 12	8 13	195 0	27 14

Ten Cows.—Sewaged Meadow Grass.

						Five-acre, Plot 3, Crop 4.		Five-acre, Plot 3, Crop 4.		Five-acre, Plot 3, Crop 4.		Ten-acre, Plot 4, Crop 4.		Ten-acre, Plot 4, Crop 4.		Ten-acre, Plot 4, Crop 4.		Ten-acre, Plot 4, Crop 4.		—	—
Food consumed.	Grass	From which Field, Plot, and Crop																			
		Quantities weighed (*tons. cwts. qrs. lbs.*)				0 13 1 18		0 19 0 5		0 11 1 17		0 19 3 5		0 13 0 2		0 10 0 11		0 10 0 14		4 16 3 16	0 1 1 15
	Oilcake (3 parts cotton & 2 parts rape-cake)				(*ditto*)	0 0 1 22		0 0 1 22		0 0 1 22		0 0 1 22		0 0 1 22		0 0 1 22		0 0 1 22		0 3 0 14	0 0 0 5
Yield of Milk, &c.	1	Cross short-horn	Aged	Mar. 10	1,208	14 11	10 2	15 2	8 13	14 3	10 0	15 3	10 4	15 7	10 13	14 6	9 1	14 1	8 14	171 0	24 7
	2	Cross short-horn	8	June 15	1,394	17 12	11 8	17 6	9 12	16 10	11 6	17 10	11 0	17 6	11 3	17 4	10 14	17 8	10 0	197 3	28 2
	3	Cross short-horn	6	Feb. 20	1,174	11 0	8 0	11 10	8 4	11 12	8 0	11 11	8 5	11 14	8 0	11 4	7 7	11 4	7 6	135 13	19 6
	4	Cross short-horn	7	Feb. 15	1,090	13 4	8 8	13 0	7 11	13 0	8 6	12 3	7 14	12 0	12 6	12 13	7 10	14 0	7 12	150 7	21 8
	5	Ayrshire – –	8	Feb. 22	1,035	10 0	7 14	10 4	7 1	11 0	7 3	10 0	6 15	11 1	7 13	10 10	7 4	11 6	6 11	125 2	17 14
	6	Cross short-horn	6	April 14	1,096	19 1	11 9	19 12	11 4	18 6	11 11	19 10	12 3	19 6	11 0	19 10	11 0	20 4	10 6	215 2	30 12
	7	Mongrel – –	Aged	April 12	892	11 12	9 5	11 10	6 7	11 0	7 2	11 11	6 8	11 7	6 12	12 0	6 11	11 8	5 2	128 15	18 7
	8	Cross short-horn	6	April 16	1,190	10 8	4 8	9 0	6	10 4	7 6	11 10	7 7	11 0	8 4	11 10	8 2	12 8	7 0	127 10	18 4
	9	Cross short-horn	7	April 18	1,087	14 6	11 2	14 10	9 14	15 8	9 14	14 6	10 7	14 5	8 10	13 0	10 4	15 2	7 8	169 0	24 2
	10	Half short-horn	8	April 25	1,278	19 13	12 9	19 12	12 0	20 0	13 3	20 5	11 14	20 0	13 2	21 2	12 10	20 2	10 15	227 7	32 8
				Totals	11,444	142 3	95 1	142 2	89 8	141 11	94 3	144 5	92 14	143 14	97 15	143 11	90 15	147 11	81 10	1,647 11	—
				Means	1,144	14 3	9 8	14 3	8 15	14 3	9 7	14 7	9 5	14 6	9 13	14 6	9 1	14 12	8 3	164 12	23 9

Five Cows.—Unsewaged or Sewaged Italian Rye Grass.

						Rye, † Crop 4.		Rye, † Crop 4.		Rye, † Crop 4.		Rye, † Crop 4.		Rye, † Crop 4.		Rye, † Crop 4.		Rye, † Crop 4.		—	—
Food consumed.	Grass	From which Field, Plot, and Crop																			
		Quantities weighed (*tons. cwts. qrs. lbs.*)				0 2 2 8		0 4 1 4		0 3 3 14		0 5 0 21		0 5 0 8		0 2 2 13		0 2 2 13		1 6 0 25	0 0 3 0
	Oilcake (3 parts cotton & 2 parts rape-cake)				(*ditto*)	0 0 0 25		0 0 0 25		0 0 0 25		0 0 0 25		0 0 0 25		0 0 0 25		0 0 0 25		0 1 2 7	0 0 0 5
Yield of Milk, &c.	1	Cross short-horn	Aged	April 20	1,121	17 14	11 6	18 6	11 9	18 6	12 10	19 12	10 1	18 12	10 14	18 8	14 7	20 8	10 12	213 13	30 9
	2	Ayrshire – –	6	Mar. 15	934	17 0	10 7	16 13	9 2	17 4	10 6	17 11	10 0	17 0	9 2	17 15	10 11	16 13	10 2	190 6	27 3
	3	Cross short-horn	Aged	Mar. 1	1,166	15 0	9 2	14 15	9 2	14 8	10 1	16 3	8 3	15 2	9 4	15 1	11 6	15 14	8 10	172 7	24 10
	4	Cross short-horn	Aged	April 15	1,295	17 1	10 3	17 1	10 0	16 14	10 8	18 4	9 6	17 15	9 9	18 0	11 0	17 2	8 4	191 3	27 5
	5	Cross short-horn	6	Jan. 2	1,234	11 2	7 0	12 0	7 5	11 15	7 2	11 7	7 3	10 10	6 9	13 2	7 14	11 12	7 7	132 8	18 15
				Totals	5,750	78 1	48 2	79 3	47 2	78 15	50 11	83 5	44 13	79 7	45 6	82 10	55 6	82 1	45 3	900 5	—
				Means	1,150	15 10	9 10	15 13	9 7	15 13	10 2	16 11	8 15	15 14	9 1	16 8	11 1	16 7	9 1	180 1	25 12

* In these cases the weights recorded are of an intermediate weighing taken on September 28.
a Other grass was given when unsewaged meadow grass was not available.
† Not experimental.

Table X.—*continued.*

Detailed Record of Food consumed, and Milk yielded, by Cows fed on Unsewaged and Sewaged Meadow Grass, and on Italian Rye Grass, with Oilcake in addition.
Third Season, 1863; 7 days.—October 6 to October 12.

Five Cows.—Unsewaged Meadow Grass. *a*

					Tuesday.		Wednesday.		Thursday.		Friday.		Saturday.		Sunday.		Monday.		Total in 7 days.		Per head per day.	
Food consumed.	Grass: From which Field, Plot, and Crop				Five-acre, Plot 3, Crop 4.		Ten-acre, Plot 4, Crop 4.		Ten-acre, Plot 4, Crop 4.		Ten-acre, Plot 4, Crop 4.		Ten-acre, Plot 3, Crop 4.		Five-acre, Plot 2, Crop 3.		Five-acre, Plot 2, Crop 3.		——		——	
	Grass: Quantities weighed (*tons. cwts. qrs. lbs.*)				0 9 3 20		0 5 2 7		0 7 3 9		0 7 3 20		0 11 3 25		0 2 2 6		0 2 2 6		2 8 1 9		0 1 1 15	
	Oilcake (3 parts cotton & 2 parts rape-cake) (*ditto*)				0 0 0 25		0 0 0 25		0 0 0 25		0 0 0 25		0 0 0 25		0 0 0 25		0 0 0 25		0 1 2 7		0 0 0 5	
Yield of Milk, &c.	Cows. Nos.	Breed.	Years old.	Dates of Calving.	Weights (Oct. 12) *lbs.*		A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	——		——	
							lbs. *ozs.*	*lbs.* *ozs.*	*lbs.* *ozs.*	*lbs.* *ozs.*	*lbs.* *ozs.*	*lbs.* *ozs.*	*lbs.* *ozs.*	*lbs.* *ozs.*	*lbs.* *ozs.*	*lbs.* *ozs.*	*lbs.* *ozs.*	*lbs.* *ozs.*	*lbs.* *ozs.*		*lbs.* *ozs.*	
	1	Cross short-horn	Aged	May 1	1,123		19 0	12 2	21 7	12 10	20 14	12 12	23 0	12 4	20 6	11 4	20 11	10 12	20 7	12 6	220 15		32 13	
	2	Cross short-horn	6	Feb. 15	1,246		11 5	7 0	11 1	6 3	10 2	5 13	10 12	5 10	10 1	5 6	8 0	5 10	9 0	5 1	111 0		15 14	
	3	Cross short-horn	3	April 13	866		14 1	9 4	15 10	9 9	15 7	9 11	15 10	8 12	14 3	13 1	14 2	8 11	14 15	8 13	171 13		24 9	
	4	Cross short-horn	8	May 20	1,090		22 3	15 14	24 1	14 2	22 1	14 6	23 12	14 4	23 4	14 2	22 1	12 0	22 0	13 4	257 6		36 12	
	5	Cross short-horn	7	April 17	1,208		15 5	9 11	16 0	9 12	16 4	10 1	17 9	8 9	17 11	9 7	16 6	9 14	17 10	9 0	183 3		26 3	
				Totals	5,533		81 14	53 15	88 3	52 4	84 12	52 11	90 11	49 7	85 9	53 4	81 4	46 15	84 0	48 8	953 5		——	
				Means	1,107		16 6	10 13	17 10	10 7	16 15	10 9	18 2	9 14	17 2	10 11	16 4	9 6	16 13	9 11	190 11		27 4	

Ten Cows.—Sewaged Meadow Grass.

					Tuesday.		Wednesday.		Thursday.		Friday.		Saturday.		Sunday.		Monday.		Total in 7 days.		Per head per day.	
Food consumed.	Grass: From which Field, Plot, and Crop				Five-acre, Plot 3, Crop 4.		Ten-acre, Plot 4, Crop 4.		Ten-acre, Plot 4, Crop 4.		Ten-acre, Plot 3, Crop 4.		Ten-acre, Plot 3, Crop 4.		Five-acre, Plot 2, Crop 3.		Five-acre, Plot 2, Crop 3.		——		——	
	Grass: Quantities weighed (*tons. cwts. qrs. lbs.*)				0 19 3 11		0 11 0 13		0 15 2 18		0 13 3 12		1 3 3 22		0 5 0 12		0 5 0 11		4 16 2 15		0 1 1 15	
	Oilcake (3 parts cotton & 2 parts rape-cake) (*ditto*)				0 0 1 22		0 0 1 22		0 0 1 22		0 0 1 22		0 0 1 22		0 0 1 22		0 0 1 22		0 3 0 14		0 0 0 5	
Yield of Milk, &c.	1	Cross short-horn	Aged	Mar. 10	1,190		13 10	9 13	14 8	9 15	14 13	9 9	14 10	9 14	14 0	9 2	14 4	9 6	14 6	10 2	168 0		24 0	
	2	Cross short-horn	8	June 15	1,360		16 4	11 6	18 2	11 0	17 8	11 0	17 12	11 0	16 13	11 1	16 12	11 0	18 2	11 0	198 12		28 6	
	3	Cross short-horn	6	Feb. 20	1,168		11 0	8 2	11 0	7 10	11 0	7 14	11 10	8 10	12 5	7 10	11 12	7 0	11 10	7 10	134 13		19 4	
	4	Cross short-horn	7	Feb. 15	1,077		13 1	9 3	13 14	8 14	13 8	9 8	14 6	9 10	13 7	9 1	13 3	8 10	14 0	9 6	159 11		22 13	
	5	Ayrshire – –	8	Feb. 22	1,033		10 3	7 12	10 14	7 6	10 12	7 3	10 12	7 4	10 13	6 12	10 12	7 0	11 10	7 4	126 5		18 1	
	6	Cross short-horn	6	April 14	1,101		17 6	12 2	18 11	11 2	18 6	11 15	19 8	11 11	20 5	10 14	18 6	11 4	20 6	11 6	213 6		30 8	
	7	Mongrel – –	Aged	April 12	868		11 0	6 14	12 0	6 12	11 4	7 12	12 4	7 2	12 6	7 0	12 4	7 5	11 12	6 0	131 11		18 13	
	8	Cross short-horn	6	April 16	1,179		10 11	8 0	10 11	7 4	10 10	7 11	9 11	7 5	10 0	6 12	10 3	6 11	9 0	8 13	123 6		17 10	
	9	Cross short horn	7	April 13	1,030		14 2	9 0	13 12	9 7	13 14	10 8	15 0	9 4	14 4	10 2	14 6	9 8	14 3	7 10	165 0		23 9	
	10	Half short-horn	8	April 25	1,290		19 3	12 14	19 10	11 10	19 2	12 0	20 8	11 10	19 0	13 0	19 6	12 0	18 0	10 3	218 2		31 3	
				Totals	11,326		136 8	95 2	143 2	91 0	140 13	95 0	146 1	93 6	143 5	91 6	141 4	89 12	143 1	89 6	1,639 2		——	
				Means	1,133		13 10	9 8	14 5	9 2	14 1	9 8	14 10	9 6	14 5	9 2	14 2	9 0	14 5	8 15	163 15		23 7	

Five Cows.—Unsewaged or Sewaged Italian Rye Grass.

					Tuesday.		Wednesday.		Thursday.		Friday.		Saturday.		Sunday.		Monday.		Total in 7 days.		Per head per day.	
Food consumed.	Grass: From which Field, Plot, and Crop				Rye, * Crop 4.		Rye, * Crop 4.		Rye, * Crop 4.		Rye, * Crop 4.		Rye, * Crop 4.		Rye, * Crop 4.		Rye, * Crop 4.		——		——	
	Grass: Quantities weighed (*tons. cwts. qrs. lbs.*)				0 4 3 20		0 5 3 16		0 4 3 24		0 4 1 22		0 6 3 7		0 3 1 12		0 3 1 12		1 13 3 1		0 0 3 24	
	Oilcake (3 parts cotton & 2 parts rape-cake) (*ditto*)				0 0 0 25		0 0 0 25		0 0 0 25		0 0 0 25		0 0 0 25		0 0 0 25		0 0 0 25		0 1 2 7		0 0 0 5	
Yield of Milk, &c.	1	Cross short-horn	Aged	April 20	1,088		17 4	11 5	19 15	12 0	20 1	11 0	19 12	12 8	20 5	11 4	19 15	10 11	19 0	11 13	216 13		31 0	
	2	Ayrshire – –	6	Mar. 15	914		17 6	9 13	17 0	11 5	16 13	9 12	17 15	10 0	17 13	9 0	16 2	9 2	17 10	9 7	189 2		27 0	
	3	Cross short-horn	Aged	Mar. 1	1,120		14 0	9 8	13 15	9 5	15 4	9 1	14 12	9 8	15 10	8 4	13 0	7 6	14 13	7 0	161 6		23 1	
	4	Cross short-horn	Aged	April 15	1,220		16 8	11 0	17 1	11 10	18 1	11 4	17 7	11 4	17 12	11 8	17 6	11 1	18 2	11 4	201 4		28 13	
	5	Cross short-horn	6	Jan. 2	1,200		11 0	7 12	11 5	7 8	10 9	8 8	11 8	6 12	11 5	7 0	10 15	7 7	12 5	7 0	130 14		18 11	
				Totals	5,542		76 2	49 6	79 4	51 12	80 12	49 9	81 6	50 0	82 13	47 0	77 6	45 11	81 14	46 8	899 7		——	
				Means	1,108		15 3	9 14	15 14	10 6	16 2	9 15	16 4	10 0	16 9	9 6	15 8	9 2	16 6	9 5	179 14		25 11	

a Other grass was given when unsewaged meadow grass was not available.

* Not experimental.

Table XI.

Summary of the Weights, Increase (or Loss), and Yield of Milk, of the Cows fed respectively on Unsewaged and Sewaged Meadow Grass, with Oilcake in addition.

Second Season, 1862.

Cows. Nos.	Weights.									Increase (or Loss) in Weight.	Yield of Milk.		
	May 1.	Intermediate. May 15.	May 29.	June 26	Intermediate. July 10.	July 24.	Aug. 21.	Sep 18.	Oct. 16.		First week.	Last week.	Average of the 24 weeks.
Three Cows.—Unsewaged Grass.*													
	lbs.	*lbs.*	*lbs.*	*lbs.*	*lbs.*	*lbs.*	*lbs.*	*lbs.*	*lbs.*	*lbs.*	*lbs. ozs.*	*lbs. ozs.*	*lbs. ozs.*
1	945	936	1,042	1,032	1,087	1,090	1,076	1,066	1,058	113	229 1	148 15	183 13
2	976	1,004	1,054	1,093	1,100	1,127	1,170	1,190	1,219	243	193 9	31 10	119 14
3	884	896	948	976	988	1,011	1,012	1,020	1,058	174	241 2	162 7	192 14
Totals -	2,805	2,836	3,044	3,101	3,175	3,228	3,258	3,276	3,335	530	663 12	343 0	..
Averages -	935	955	1,015	1,054	1,058	1,076	1,086	1,092	1,112	177	221 4	114 5	165 8
Twelve Cows.—Sewaged Grass.													
1	1,143	..	1,178	1,246	1,190	1,192	1,224	1,270	1,288	145	165 2	127 10	143 10
2	1,138	..	1,208	1,262	1,263	1,246	1,237	1,267	1,270	132	179 7	77 11	117 5
3	1,076	..	1,153	1,194	1,204	1,232	1,224	1,288	1,223	147	168 15	66 14	122 14
4	966	..	972	994	983	1,000	973	973	936	− 30	202 7	76 3	131 9
5	1,076	..	1,107	1,158	1,132	1,176	1,158	1,199	1,214	138	177 3	67 0	110 5
6	1,006	..	1,093	1,126	1,118	1,121	1,125	1,150	1,169	163	185 1	127 9	150 14
7†	1,112	..	1,068	1,084	1,099	1,071	1,109	1,106	1,101	− 11	314 3	162 14	220 10
8	723	..	785	797	822	824	834	850	868	145	176 6	128 12	136 7
9	965	..	1,018	1,088	1,082	1,116	1,136	1,232	1,224	259	174 12	118 9	147 3
10	866	..	950	953	918	952	950	960	975	109	245 8	152 0	199 10
11	781	..	835	850	828	854	854	834	830	49	206 3	129 15	154 4
12	984	..	1,090	1,142	1,116	1,162	1,155	1,146	1,098	114	178 0	133 10	145 11
Totals -	11,836	..	12,460	12,804	12,755	12,946	12,979	13,275	13,196	1,360	2,373 3	1,368 11	..
Averages -	986	.	1,038	1,075	1,063	1,079	1,082	1,106	1,099	113	197 12	114 1	148 6

* It should be observed, that from May 1 to May 15, the first crop of unsewaged meadow grass not being ready to cut, the 3 cows had Italian rye-grass, and for 20 days, from August 9 to August 28, in default of unsewaged grass, they had green clover; but the figures given in the last four columns of this Table relate to the whole period, irrespectively of these unavoidable irregularities.

† The No. 7 Cow put up on May 1, which weighed 1,126 lbs., fell ill, and was replaced on May 20 by another, weighing 1,112 lbs., as above entered, and this latter is, for convenience, adopted as the original weight in the calculations for this and the following Table.

Table XII.

Summary of Food consumed, and Milk and Increase yielded, by Cows fed respectively on Unsewaged and Sewaged Meadow Grass, with Oilcake in addition.

Second Season, 1862.

Periods.* Dates.*	No. of Days.	8 Cows.—Unsewaged Grass. Average per head per day. Food consumed. Green Grass.	Oil-cake.	Milk yielded.	Average Increase in weight per head per week.	12 Cows.—Sewaged Grass. Average per head per day. Food consumed. Green Grass.	Oil-cake.	Milk yielded.	Average Increase (or Loss) in weight per head per week.
		lbs.	*lbs.*	*lbs. ozs.*	*lbs. ozs.*	*lbs.*	*lbs.*	*lbs. ozs.*	*lbs. ozs.*
May 2 to May 8	7	152	3	31 10	10 2¼	133	3	28 4	
„ 9 to „ 15	7	158	3	31 4		175	3	26 7	13 0
„ 16 to „ 22	7	206	3	29 9	29 10½	147	3	25 2	
„ 23 to „ 29	7	158	3	29 7		154	3	25 8	
„ 30 to June 5	7	152	3	28 4		143	3	23 11	
June 6 to „ 12	7	142	3	26 6	9 12	145	3	22 11	9 0¼
„ 13 to „ 19	7	160	3	25 8		89	3	22 2	
„ 20 to „ 26	7	145	3	24 15		114	3	21 1	
„ 27 to July 3	7	104	3½	24 0		136	3½	20 14	
July 4 to „ 10	7	125	3½	23 8	5 9½	137	3½	21 12	1 1½
„ 11 to „ 17	7	79	4½	22 13		145	4½	21 7	
„ 18 to „ 24	7	74	4½	22 2		125	4½	21 2	
„ 25 to „ 31	7	161	4	23 4		113	4	21 8	
Aug. 1 to Aug. 7	7	86	0	21 2	2 8	112	0	21 0	0 11
„ 8 to „ 14	7	176	4	21 14		125	4	21 1	
„ 15 to „ 21	7	90	4	22 2		139	4	20 13	
„ 22 to „ 28	7	120	4	22 7		153	4	29 1	
„ 29 to Sept. 4	7	99	4	22 0	1 8	114	4	19 7	6 2½
Sept. 5 to „ 11	7	140	4	22 0		157	4	18 15	
„ 12 to „ 18	7	140	4	21 0		164	4	18 11	
„ 19 to „ 25	7	133	4	20 0		136	4	17 8	
„ 26 to Oct. 2	7	115	5	18 9	4 14½	153	5	17 5	−1 10½
Oct. 3 to „ 9	7	98	5	17 8		141	5	16 6	
„ 10 to „ 16	7	117	5	16 5		160	5	16 5	
May 2 to Oct. 16†	168	130	3⅝	23 10	7 6	138	3⅝	21 3	4 11½

* The dates given are of the "milk yielded," but the periods of the "food consumed" date one day earlier in each case, as also do those of the "average increase (or loss) in weight per head per week."

† It should be observed, that from May 1 to May 15, the first crop of unsewaged meadow grass not being ready to cut, the three cows had Italian rye-grass, and for 20 days, from August 9 to August 28, in default of unsewaged grass, they had green clover; but the figures given in the bottom line of this Table relate to the whole period, irrespectively of these unavoidable irregularities.

Table XIII.

Summary of the Weights, Increase (or Loss), and Yield of Milk, of the Cows fed respectively on Unsewaged Meadow Grass, on Sewaged Meadow Grass, and on Italian Rye Grass (Unsewaged and Sewaged), each for Twelve Weeks alone, and each for Twelve Weeks with Oilcake in addition.

TABLE XIII.

SUMMARY of the WEIGHTS, INCREASE (or LOSS), and YIELD of MILK, of the COWS fed ITALIAN RYE GRASS (Unsewaged and Sewaged), each for Twelve

THIRD

Cows. Nos.	TWELVE WEEKS ON GRASS ALONE.								
	Weights.					Increase (or Loss) in Weight.	Yield of Milk.		
	Apr. 27.	May 25.	Intermediate. June 8.	June 22.	July 20.		First Week.	Last Week.	Average.
FIVE COWS.—UNSEWAGED									
	lbs.	*lbs.*	*lbs.*	*lbs.*	*lbs.*	*lbs.*	*lbs. ozs.*	*lbs. ozs.*	*lbs. ozs.*
1*	1,020	1,064	1,062	1,078	1,114	94	207 12	201 14	216 13
2	1,117	1,184	1,177	1,190	1,226	109	235 14	148 4	178 9
3	746	818	821	804	830	84	200 10	144 1	169 12
4†	1,089	1,096	1,094	1,069	1,09	69	178 0	253 12	231 12
5	1,058	1,112	1,110	1,097	1,142	84	230 0	201 4	222 15
Totals -	5,030	5,274	5,264	5,238	5,404	440	1,052 4	949 3	1,019 13
Averages-	1,006	1,055	1,053	1,048	1,081	88	210 7	189 13	203 15
TEN COWS.—SEWAGED									
1	1,064	1,136	..	1,121	1,154	90	235 2	197 11	210 9
2‡	1,036	1,010	..	1,280	1,334	50	283 3	261 3	268 4
3	1,030	1,060	..	1,066	1,146	116	214 7	174 1	192 7
4	1,036	990	..	996	1,040	4	195 3	163 9	182 2
5	1,002	984	..	1,000	1,029	27	185 9	166 5	174 2
6	880	956	..	958	1,016	136	212 5	202 0	216 3
7	808	838	..	894	892	84	192 0	161 9	182 8
8	960	1,026	..	1,068	1,122	162	159 3	148 0	162 10
9	906	954	..	964	1,046	140	225 10	183 2	213 4
10§	1,320	1,358	..	1,186	1,226	31	164 15	244 9	175 15
Totals -	10,042	10,312	..	10,533	11,055	840	2,047 9	1,902 1	1,973 0
Averages-	1,004	1,031	..	1,053	1,106	84	204 12	190 3	197 5
FIVE COWS.—UNSEWAGED OR									
1	1,066	1,122	..	1,122	1,140	74	286 6	243 14	288 0
2	874	902	..	878	910	36	262 0	192 12	223 13
3*	1,042	1,106	..	1,087	1,130	88	**285 8	165 2	212 11
4	1,185	1,176	..	1,180	1,218	33	280 14	215 7	245 12
5¶	1,114	1,048	..	1,128	1,184	−8	210 1	138 15	138 5
Totals -	5,281	5,354	..	5,395	5,582	223	1,324 13	956 [illegible]2	1,108 9
Averages-	1,056	1,071	..	1,079	1,116	45	264 15	191 4	221 11

* On May 25, No. 1 cow on unsewaged meadow grass, and No. 3 cow on rye-grass were transposed, and the weights entered in the Table are, from the commencement in each case, those of the newly placed cow.

† The No. 4 cow on unsewaged meadow grass put up at the commencement (April 27) increased 73 lbs. by May 25, but diminished considerably in yield of milk, and as she was obviously fattening, was then replaced by the cow whose weight is entered for that date; and in the columns "increase in weight" and "yield of milk" the results obtained on the two cows, successively, are given.

‡ The No. 2 cow on sewaged meadow grass put up at the commencement (April 27) had lost 54 lbs. by June 22, and being ill was removed June 24, and replaced by the animal whose weight on June 22 is entered for that date; but in the columns "increase in weight" and "yield of milk" the results obtained on the two cows, successively, are given.

§ The No. 10 cow put up at the commencement (April 27) diminished considerably in yield of milk, and slipping her calf about June 22, was then replaced by the cow whose weight is entered under that date; but in the columns "increase in weight" and "yield of milk" the results obtained on the two cows, successively, are given.

TABLE XIII.

respectively on UNSEWAGED MEADOW GRASS, on SEWAGED MEADOW GRASS, and on Weeks alone, and each for Twelve Weeks with OILCAKE in addition.

SEASON, 1863.

TWELVE WEEKS ON GRASS AND OILCAKE.										TOTAL 24 WEEKS.	
Weights.						Increase (or Loss) in Weight.	Yield of Milk.			Increase in Weight.	Average Yield of Milk per Week.
Intermediate. Aug. 3.	Aug. 17.	Intermediate. Sept. 8.	Sept. 14.	Intermediate. Sept. 28.	Oct. 12.		First Week.	Last Week.	Average.		
MEADOW GRASS.††											
lbs.	*lbs.*	*lbs.*	*lbs.*	*lbs.*	*lbs.*	*lbs.*	*lbs. ozs.*	*lbs. ozs.*	*lbs. ozs.*	*lbs.*	*lbs. ozs.*
1,138	1,176	1,186	1,199	1,204	1,123	9	220 15	229 15	235 4	103	226 0
1,234	1,253	1,274	1,268	1,272	1,246	20	156 11	111 0	138 6	129	158 8
854	878	899	897	889	866	36	156 10	171 13	169 4	120	169 8
1,118	1,118	1,146	1,141	1,098	1,090	− 2	274 7	257 6	270 6	67	251 1
1,170	1,194	1,267	1,236	1,244	1,208	66	205 1	183 3	195 2	150	209 0
5,514	5,619	5,772	5,741	5,707	5,533	129	1,013 12	953 5	1,008 6	569	1,014 1
1,103	1,124	1,154	1,148	1,141	1,107	26	202 12	190 11	201 11	114	202 13
MEADOW GRASS.											
..	1,182	..	1,208	..	1,190	36	211 11	168 0	180 13	126	200 3
..	1,384	..	1,394	..	1,360	− 24	263 12	198 12	227 7	26	245 5
..	1,182	..	1,174	..	1,168	22	174 5	134 13	153 3	138	172 13
..	1,070	..	1,090	..	1,077	37	173 5	159 11	160 14	41	171 8
..	1,019	..	1,035	..	1,033	4	173 6	126 5	145 1	31	159 9
..	1,048	..	1,096	..	1,101	85	221 6	213 6	211 7	221	213 13
..	884	..	892	..	868	24	175 14	131 11	149 8	60	166 0
..	1,140	..	1,190	..	1,179	57	153 7	123 6	141 7	219	152 1
..	1,040	..	1,087	..	1,060	14	219 13	165 0	193 14	154	203 9
..	1,260	..	1,278	..	1,290	64	266 12	218 2	244 8	95	210 3
..	11,209	..	11,444	..	11,326	271	2,033 11	1,639 2	1,817 2	1,111	1,895 0
..	1,121	..	1,144	..	1,133	27	203 6	163 15	181 11	111	189 8
SEWAGED ITALIAN RYE GRASS.											
..	1,136	1,130	1,121	..	1,088	− 52	258 3	216 13	235 11	22	261 14
..	922	952	934	..	914	4	194 2	189 2	195 1	40	209 7
..	1,146	1,169	1,166	..	1,120	− 10	168 8	161 6	171 9	78	192 2
..	1,271	1,299	1,295	..	1,220	2	223 10	201 4	221 2	35	233 7
..	1,195	1,224	1,234	..	1,200	16	147 6	130 14	142 15	8	140 10
..	5,684	5,754	5,750	..	5,542	− 40	991 13	899 7	966 6	183	1,037 8
..	1,137	1,151	1,150	..	1,108	− 8	198 6	179 14	193 4	37	207 8

¶ The No. 5 cow on rye-grass put up at the commencement (April 27), falling very ill, had lost by May 25 144 lbs., and was replaced by another cow whose weight is given under that date; but in the columns "increase in weight" and "yield of milk" the results obtained on the two cows, successively, are given.

** As will be seen by reference to Appendix, Table X. p. 123, the yield of milk of No. 3 cow on rye-grass is only given for four out of the seven days of the first week of the experiment, but in the calculations the yield per diem for the remaining three days is assumed to be the same as that of the average of the ensuing week of the No. 3 cow put up on May 5.

†† From April 27 to June 8, the first crop of unsewaged meadow grass not being ready to cut, the five cows nominally fed on it had Italian rye-grass, and they also received Italian rye-grass from Aug. 2 to Sept. 8 in default of unsewaged grass; but the figures in the columns "increase in weight" and "yield of milk" are irrespective of these unavoidable irregularities.

Table XIV.

Summary of Food consumed, and Milk and Increase yielded, by Cows fed respectively on Unsewaged Meadow Grass, on Sewaged Meadow Grass, and on Italian Rye Grass (Unsewaged and Sewaged), each for Twelve Weeks alone, and each for Twelve Weeks with Oilcake in addition.

Third Season, 1863.

Periods.* Dates.*	No. of Days.	5 Cows.—Unsewaged Meadow Grass. Average per head per day. Food consumed. Green Grass.	Oilcake.	Milk yielded.	Average Increase (or Loss) in weight per head per week.	10 Cows.—Sewaged Meadow Grass. Average per head per day. Food consumed. Green Grass.	Oilcake.	Milk yielded.	Average Increase (or Loss) in weight per head per week.	5 Cows.—Unsewaged or Sewaged Italian Rye Grass. Average per head per day. Food consumed. Green Grass.	Oilcake.	Milk yielded.	Average Increase (or Loss) in weight per head per week.
Twelve Weeks. Grass alone.		*lbs.*	*lbs.*	*lbs. ozs.*	*lbs. ozs.*	*lbs.*	*lbs.*	*lbs. ozs.*	*lbs. ozs.*	*lbs.*	*lbs.*	*lbs. ozs.*	*lbs. ozs.*
April 28 to May 4	7	112	..	30 1		113	..	29 4		112	..	37 14	
May 5 to „ 11	7	124	..	28 0	15 8	122	..	31 2	6 12	131	..	35 14	−0 4
„ 12 to „ 18	7	132	..	28 6		145	..	31 11		133	..	32 10	
„ 19 to „ 25	7	126	..	27 8		145	..	29 12		123	..	33 14	
„ 26 to June 1	7	109	..	34 0		153	..	29 13		150	..	34 8	
June 2 to „ 8	7	127	..	32 6	− 1 12½	137	..	27 15	1 3½	168	..	33 3	2 0¼
„ 9 to „ 15	7	160	..	30 5		132	..	25 8		187	..	31 10	
„ 16 to „ 22	7	113	..	29 9		116	..	24 3		175	..	29 13	
„ 23 to „ 29	7	106	..	27 15		140	..	26 3		152	..	27 14	
„ 30 to July 6	7	103	..	27 1	8 4¼	170	..	27 11	13 0¼	179	..	27 13	9 5½
July 7 to „ 13	7	50	..	27 3		184	..	28 0		196	..	27 12	
„ 14 to „ 20	7	62	..	27 2		158	..	27 3		178	..	27 5	
April 28 to „ 20†	84	110	..	29 2	7 5½	143	..	28 3	7 0	157	..	31 11	3 11½
Twelve Weeks. Grass and Oilcake.													
July 21 to July 27	7	67	3	28 15		157	3	29 1		162	3	28 5	
„ 28 to Aug. 3	7	54	3	29 11	10 12	179	3	29 9	3 13½	155	3	28 3	5 1½
Aug. 4 to „ 10	7	87	3	30 8		188	3	28 8		134	3	28 11	
„ 11 to „ 17	7	64	3	30 7		176	3	27 5		104	3	28 15	
„ 18 to „ 24	7	56	3	30 9		176	3	26 15		95	3	28 6	
„ 25 to „ 31	7	50	3	29 0	6 1½	180	3	25 4	5 14	90	3	28 2	3 4½
Sept. 1 to Sept. 7	7	73	3	27 10		180	3	24 9		119	3	27 9	
„ 8 to „ 14	7	110	3	28 2		196	3	24 5		69	3	27 5	
„ 15 to „ 21	7	99	5	28 2		149	5	24 13		128	5	27 5	
„ 22 to „ 28	7	113	5	27 9	−10 6½	173	5	24 3	− 2 15¼	93	5	27 1	−10 6½
„ 29 to Oct. 5	7	155	5	27 14		155	5	23 9		84	5	25 12	
Oct. 6 to „ 12	7	155	5	27 4		155	5	23 7		108	5	25 11	
July 21 to „ 12†	84	90	3⅝	28 13	2 2½	172	3⅝	25 15	2 4½	112	3⅝	27 10	− 0 10½
Twenty-four Weeks. First 12 Weeks, Grass alone. Second 12 Weeks, Grass and Oilcake.													
April 28 to Oct. 12†	168	100	1⅝	28 15	4 11¼	158	1⅝	27 1	4 10	134	1⅝	29 10	1 8¼

* The dates given are of the "milk yielded," but the periods of the "food consumed" date one day earlier in each case, as also do those of the "average increase (or loss) in weight per head per week."

† From April 27 to June 8, the first crop of unsewaged meadow grass not being ready to cut, the five cows nominally fed on it had Italian rye-grass; and they also received Italian rye-grass from Aug. 2 to Sept. 8 in default of unsewaged meadow grass, but the figures in these lines relate to the whole period, irrespectively of these unavoidable irregularities.

Table XV.

Results of the Analyses of 17 Samples of Sewage-water collected in the Five-acre Field.

Second Season 1861–2 ; November 1861—October 1862 inclusive.

	Grains per Gallon.																	
	1861.		1862.															
	Nov. 4–6.	Dec. 17 & 18.	Jan. 6–8.	Feb. 3–5.	March 3–5.	April 3–5.	May 8–10.	May 22–24.	June 5–7.	July 10–12.	July 21–26.	August 4–9.	August 20 & 21.	September 1 & 2.	September 22 & 23.	October —	October 13 & 14.	Mean; 17 Samples.
Sample numbers	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	
	Grains.	Grains.	Grains.	Grains.	Grains.	Grains.	Grains.	Grains.	Grains.	Grains.	Grains.	Grains.	Grains.	Grains.	Grains.	Grains.	Grains.	Grains.
Organic matter — In solution	11·60	10·70	8·90	8·40	11·19	6·20	6·82	10·10	7·55	6·60	6·10	7·80	9·78	9·00	8·69	7·00	6·70	8·42
Organic matter — In suspension	25·60	39·30	20·50	11·80	16·05	9·25	20·35	10·90	15·10	13·30	19·70	12·70	14·74	17·70	19·86	9·60	7·63	16·71
Organic matter — Total	37·20	50·00	29·40	20·20	27·24	15·45	27·17	21·00	22·65	19·90	25·80	20·50	24·52	26·70	28·55	16·60	14·33	25·13
Inorganic matter — In solution	47·20	43·00	33·30	30·60	27·21	34·35	31·20	34·60	28·25	27·60	40·30	32·70	36·52	42·40	38·55	33·75	33·51	35·00
Inorganic matter — In suspension	21·00	10·80	13·30	11·40	14·77	9·65	55·15	22·60	32·35	22·40	22·70	19·10	30·02	22·20	28·13	14·70	15·05	21·31
Inorganic matter — Total	68·20	53·80	45·60	42·00	41·98	44·00	86·35	57·20	60·60	50·00	63·00	51·80	66·54	64·60	66·68	48·45	46·56	56·31
Total in solution	58·80	53·70	42·20	39·00	38·40	40·55	38·02	44·70	35·80	34·20	46·40	40·50	46·30	51·40	47·24	40·75	40·21	43·42
Total in suspension	46·60	50·10	32·80	23·20	30·82	18·90	75·50	33·50	47·45	35·70	42·40	31·80	44·76	39·90	47·99	24·30	20·68	38·02
Total solid matter	105·40	103·80	75·00	62·20	69·22	59·45	113·52	78·20	83·25	69·90	88·80	72·30	91·06	91·30	95·23	65·05	60·89	81·44
Ammonia — In solution	8·71	7·07	3·82	4·18	4·49	2·00	2·16	3·35	2·23	3·00	4·28	5·15	4·63	7·38	5·56	4·39	3·31	4·45
Ammonia — In suspension	2·20	2·23	1·25	1·38	1·99	0·55	1·82	0·78	1·13	0·75	1·97	1·66	1·69	1·23	2·13	0·96	0·89	1·45
Ammonia — Total	10·91	9·30	5·07	5·56	6·48	2·55	3·98	4·13	3·36	3·75	6·25	6·81	6·32	8·61	7·69	5·35	4·20	5·90
Phosphoric acid	2·14	1·53	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Potass	4·95	3·28	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Soda	9·44	8·53	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..

Table XVI.

Results of the Analyses of 17 Samples of Sewage-water collected in the Ten-acre Field.

Second Season 1861–2; November 1861—October 1862 inclusive.

	Grains per Gallon.																	
	1861.		1862.															Mean; 17 Samples.
							May		June	July		August.		September.		October.		
	Nov. 4–6.	Dec. 17.	Jan. 7.	Feb. 11.	March 4.	April 1 & 2.	5–7.	19–21.	2–4.	7–12.	21–26.	4–9.	18 & 19.	1 & 2.	22 & 23.	—	13 & 14.	
Sample Numbers -	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	
	Grains.	Grains.	Grains.	Grains.	Grains.	Grains.	Grains.	Grains.	Grains.	Grains.	Grains.	Grains.	Grains.	Grains.	Grains.	Grains.	Grains.	Grains.
Organic matter. In solution -	10·60	9·40	9·00	7·00	9·42	6·68	6·20	7·70	8·10	7·40	6·90	9·40	6·70	8·30	5·80	8·79	8·30	7·98
Organic matter. In suspension	30·40	25·40	16·30	8·90	9·88	8·90	33·80	14·45	20·40	17·30	7·00	14·42	12·37	20·42	26·38	13·84	8·20	16·96
Organic matter. Total -	41·00	34·80	25·30	15·90	19·30	15·58	40·00	22·15	28·50	24·70	13·90	23·82	19·07	28·72	32·18	22·63	16·50	24·94
Inorganic matter. In solution -	48·40	41·70	33·70	32·40	28·18	34·60	28·21	31·10	31·90	28·80	30·10	33·02	34·59	38·90	32·30	35·52	31·70	33·83
Inorganic matter. In suspension	30·65	19·30	8·10	5·80	3·02	6·35	61·10	21·05	26·75	26·90	19·90	15·86	15·34	17·08	37·93	20·12	11·80	20·42
Inorganic matter. Total -	79·05	61·00	41·80	38·20	31·20	40·95	89·31	52·15	58·65	55·70	50·00	48·88	49·93	55·98	70·23	55·64	43·50	54·25
Total in solution -	59·00	51·10	42·70	39·40	37·60	41·28	34·41	38·80	40·00	36·20	37·00	42·42	41·29	47·20	38·10	44·31	40·00	41·81
Total in suspension -	61·05	44·70	24·40	14·70	12·90	15·25	94·90	35·50	47·15	44·20	26·90	30·28	27·71	37·50	64·31	33·96	20·00	37·38
Total solid matter -	120·05	95·80	67·10	54·10	50·50	56·53	129·31	74·30	87·15	80·40	63·90	72·70	69·00	84·70	102·41	78·27	60·00	79·19
Ammonia. In solution -	8·63	6·25	4·28	4·25	4·56	1·75	3·69	3·06	3·16	3·60	4·38	4·74	4·86	7·09	4·69	4·39	3·27	4·51
Ammonia. In suspension	2·75	1·42	1·51	0·90	0·94	0·96	2·75	1·09	1·52	2·04	1·49	0·82	0·78	1·07	2·76	1·73	0·63	1·48
Ammonia. Total -	11·38	7·67	5·79	5·15	5·50	2·71	6·44	4·15	4·68	5·64	5·87	5·56	5·64	8·16	7·45	6·12	3·90	5·99
Phosphoric acid -	2·39	1·15	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Potass - - -	4·63	3·40	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Soda - - -	10·79	8·83	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..

Table XVII.

Comparative and Average Composition of the Sewage-water collected in the Two Fields.

Second Season 1861–2 ; November 1861.—October 1862 inclusive.

Grains per Gallon.

—	1861.				1862.																				Average for the 12 months in the two fields.
	November.		December.		January.		February.		March.		April.		May.		June.		July.		August.		September.		October.		
	5-acre field.	10-acre field.	5-acre field.	10-acre field.	5-acre field.	10-acre field.	5-acre field.	10-acre field.	5-acre field.	10-acre field.	5-acre field.	10-acre field.	5-acre field.	10-acre field.	5-acre field.	10-acre field.	5-acre field.	10-acre field.	5-acre field.	10-acre field.	5-acre field.	10-acre field.	5-acre field.	10-acre field.	
Number of Analyses -	1	1	1	1	1	1	1	1	1	1	1	1	2	2	1	1	2	2	2	2	2	2	2	2	34
Organic matter. In solution -	Gns. 11·60	Gns. 10·60	Gns. 10·70	Gns. 9·40	Gns. 8·90	Gns. 9·00	Gns. 8·40	Gns. 7·00	Gns. 11·19	Gns. 9·42	Gns. 6·20	Gns. 6·68	Gns. 8·46	Gns. 6·95	Gns. 7·55	Gns. 8·10	Gns. 6·35	Gns. 7·15	Gns. 8·79	Gns. 8·05	Gns. 8·85	Gns. 7·05	Gns. 6·85	Gns. 8·55	Gns. 8·41
Organic matter. In suspension	25·60	30·40	39·30	25·40	20·50	16·30	11·80	8·90	16·05	9·88	9·25	8·90	15·63	24·13	15·10	20·40	16·50	12·15	13·72	13·40	18·78	23·40	8·62	11·02	17·30
Organic matter. Total -	37·20	41·00	50·00	34·80	29·40	25·30	20·20	15·90	27·24	19·30	15·45	15·58	24·09	31·08	22·65	28·50	22·85	19·30	22·51	21·45	27·63	30·45	15·47	19·57	25·71
In-organic matter. In solution -	47·20	48·40	43·00	41·70	33·30	33·70	30·60	32·40	27·21	28·18	34·35	34·60	32·90	29·66	28·25	31·90	33·95	29·45	34·61	33·81	40·48	35·60	33·63	33·61	34·69
In-organic matter. In suspension	21·00	30·65	10·80	19·30	12·30	8·10	11·40	5·80	14·77	3·02	9·65	6·35	38·88	41·07	32·35	26·75	22·55	23·40	24·56	15·60	25·16	27·51	13·88	15·96	19·20
In-organic matter. Total -	68·20	79·05	53·80	61·00	45·60	41·80	42·00	38·20	41·98	31·20	44·00	40·95	71·78	70·73	60·60	58·65	56·50	52·85	59·17	49·41	65·64	63·11	47·51	49·57	53·89
Total in solution -	58·80	59·00	53·70	51·10	42·20	42·70	39·00	39·40	38·40	37·60	40·55	41·28	41·36	36·61	35·80	40·00	40·30	36·60	43·40	41·86	49·33	42·65	40·48	42·16	43·10
Total in suspension -	46·60	61·05	50·10	44·70	32·80	24·40	23·20	14·70	30·82	12·90	18·90	15·25	54·51	65·20	47·45	47·15	39·05	35·55	38·28	29·00	43·94	50·91	22·50	26·98	36·50
Total solid matter -	105·40	120·05	103·80	95·80	75·00	67·10	62·20	54·10	69·22	50·50	59·45	56·53	95·87	101·81	83·25	87·15	79·35	72·15	81·68	70·86	93·27	93·56	62·98	69·14	79·60
Ammonia. In solution -	8·71	8·63	7·07	6·25	3·82	4·28	4·18	4·25	4·49	4·56	2·00	1·75	2·76	3·38	2·23	3·16	3·64	3·99	4·89	4·80	6·47	5·89	3·85	3·83	4·54
Ammonia. In suspension	2·20	2·75	2·23	1·42	1·25	1·51	1·38	0·90	1·99	0·94	0·55	0·96	1·30	1·92	1·13	1·52	1·36	1·77	1·68	0·80	1·68	1·92	0·93	1·18	1·47
Ammonia. Total -	10·91	11·38	9·30	7·67	5·07	5·79	5·56	5·15	6·48	5·50	2·55	2·71	4·06	5·30	3·36	4·68	5·09	5·76	6·57	5·60	8·15	7·81	4·78	5·01	6·01

Table XVIII.

Results of the Analyses of 13 Samples of Sewage-water collected in the Five-acre Field.
Third Season 1862–3; November 1862—May 1863 inclusive.

—	Grains per Gallon.													
	1862.				1863.									Mean; 13 Samples.
	November		December		January		February		March		April 6, 8, & 9.	May		
	6–8.	20–22.	4–6.	18–20.	8–10.	22–24.	5–7.	19–21.	2, & 4–7.	16, & 18–21.		4–6.	18–20.	
Sample numbers	1	2	3	4	5	6	7	8	9	10	11	12	13	
	Grains.	Grains.	Grains.	Grains.	Grains.	Grains.	Grains.	Grains.	Grains.	Grains.	Grains.	Grains.	Grains.	Grains.
Organic matter. In solution	7·65	7·62	7·32	8·40	7·50	9·90	6·70	5·10	5·60	8·00	6·80	6·75	7·35	7·28
Organic matter. In suspension	25·30	28·40	27·44	13·20	12·40	16·50	11·40	28·55	35·10	14·60	22·35	20·45	13·70	20·72
Organic matter. Total	32·95	36·02	34·76	21·60	19·90	26·40	18·10	33·65	40·70	22·60	29·15	27·20	21·05	28·00
Inorganic matter. In solution	29·75	35·00	31·98	33·22	31·00	34·10	28·35	31·50	33·65	34·10	32·85	41·55	38·00	33·47
Inorganic matter. In suspension	44·02	34·33	40·48	18·22	27·05	29·80	16·65	57·55	64·35	26·45	33·25	17·50	27·50	33·63
Inorganic matter. Total	73·77	69·33	72·46	51·44	58·05	63·90	45·00	89·05	98·00	60·55	66·10	59·05	65·50	67·10
Total in solution	37·40	42·62	39·30	41·62	38·50	44·00	35·05	36·60	39·25	42·10	39·65	48·30	45·35	40·75
Total in suspension	69·32	62·73	67·92	31·42	39·45	46·30	28·05	86·10	99·45	41·05	55·60	37·95	41·20	54·35
Total solid matter	106·72	105·35	107·22	73·04	77·95	90·30	63·10	122·70	138·70	83·15	95·25	86·25	86·55	95·10
Ammonia. In solution	3·86	5·90	4·19	3·87	1·94	2·24	3·20	4·44	4·86	5·40	4·68	6·49	6·33	4·41
Ammonia. In suspension	1·99	2·24	1·61	1·46	1·20	1·31	0·79	2·58	3·46	1·09	1·43	1·23	1·05	1·65
Ammonia. Total	5·85	8·14	5·80	5·33	3·14	3·55	3·99	7·02	8·32	·49	6·11	7·72	7·38	6·06

TABLE XIX.

RESULTS of the Analyses of 12 Samples of Sewage-water collected in the Ten-acre Field.

Third Season 1862–3; November 1862—May 1863 inclusive.

	GRAINS PER GALLON.												
	1862.				1863.								Mean; 12 Samples.
	November		December		January		February		March		April 7.	May 7 & 8.	
	3–5.	17–19.	1–3.	15–17.	5–7.	19–21	2–4.	16–18.	3	17			
Sample Numbers	1	2	3	4	5	6	7	8	9	10	11	12	
	Grains.	Grains.	Grains.	Grains.	Grains.	Grains.	Grains.	Grains.	Grains.	Grains.	Grains.	Grains.	Grains.
Organic matter. In solution	6·20	8·80	6·96	8·36	8·60	10·20	4·35	4·35	5·95	7·65	6·35	7·50	7·11
Organic matter. In suspension	19·12	18·50	25·08	15·75	21·85	15·10	16·25	27·65	10·90	7·40	13·75	20·60	17·66
Organic matter. Total	25·32	27·30	32·04	24·11	30·45	25·30	20·60	32·00	16·85	15·05	20·10	28·10	24·77
Inorganic matter. In solution	34·50	33·50	31·90	28·00	26·30	31·90	29·15	32·50	29·85	31·25	26·20	42·80	31·49
Inorganic matter. In suspension	21·60	24·10	30·33	22·90	34·55	24·50	22·65	37·00	16·70	15·85	30·40	18·50	24·92
Inorganic matter. Total	56·10	57·60	62·23	50·90	60·85	56·40	51·80	69·50	46·55	47·10	56·60	61·30	56·41
Total in solution	40·70	42·30	38·86	36·36	34·90	42·10	35·50	36·85	35·80	38·90	32·55	50·30	38·60
Total in suspension	40·72	42·60	55·41	38·65	56·40	39·60	38·90	64·65	27·60	23·25	44·15	39·10	42·58
Total solid matter	81·42	84·90	94·27	75·01	91·30	81·70	72·40	101·50	63·40	62·15	76·70	89·40	81·18
Ammonia. In solution	4·95	4·90	4·06	2·95	1·91	2·53	3·10	4·60	4·22	5·56	3·41	6·40	4·05
Ammonia. In suspension	1·72	1·65	1·66	1·03	1·46	1·13	0·77	2·84	1·12	0·84	1·63	1·28	1·43
Ammonia. Total	6·67	6·55	5·72	3·98	3·37	3·66	3·87	7·44	5·34	6·40	5·04	7·68	5·48

Table XX.

Results of the Analyses of 10 Mixed Samples of Sewage-water, each collected partly in the Five-acre and partly in the Ten-acre Field.
Third Season 1863 ; June—October inclusive.

	Grains per Gallon.										
	1863.										Mean 10 Samples.
	June		July		August		September		October		
	1–6.	15–19.	6–10.	20–24.	3–7.	17–21.	7–11.	21–25.	5–9.	19–24.	
Sample Numbers	1	2	3	4	5	6	7	8	9	10	
	Grains.	Grains.	Grains.	Grains.	Grains.	Grains.	Grains.	Grains.	Grains.	Grains.	Grains.
Organic matter. In solution	8·50	7·15	9·10	9·00	13·00	9·90	9·30	8·50	11·10	11·70	9·73
Organic matter. In suspension	28·15	18·00	22·00	36·80	24·30	34·40	76·30	31·60	52·10	36·10	35·97
Organic matter. Total	36·65	25·15	31·10	45·80	37·30	44·30	85·60	40·10	63·20	47·80	45·70
Inorganic matter. In solution	45·70	38·15	46·20	43·20	40·50	52·10	47·30	54·40	54·10	53·50	47·52
Inorganic matter. In suspension	43·50	23·65	36·20	21·00	33·10	25·10	137·00	49·60	61·80	38·40	46·93
Inorganic matter. Total	89·20	61·80	82·40	64·20	73·60	77·20	184·30	104·00	115·90	91·90	94·45
Total in solution	54·20	45·30	55·30	52·20	53·50	62·00	56·60	62·90	65·20	65·20	57·25
Total in suspension	71·65	41·65	58·20	57·80	57·40	59·50	213·30	81·20	113·90	74·50	82·90
Total solid matter	125·85	86·95	113·50	110·00	110·90	121·50	269·90	144·10	179·10	139·70	140·15
Ammonia. In solution	7·73	5·27	7·23	6·46	6·75	7·47	7·40	10·21	9·76	8·37	7·66
Ammonia. In suspension	2·75	0·65	1·98	3·79	2·57	1·84	4·74	2·35	3·05	2·77	2·65
Ammonia. Total	10·48	5·92	9·21	10·25	9·32	9·31	12·14	12·56	12·81	11·14	10·31

Table XXI.

Comparative and average Composition of the Sewage-water collected in the Two Fields.

Third Season 1862–3; November 1862—October 1863 inclusive.

	Grains per Gallon.																										
	1862.						1863.																				Average for the 12 months in the two fields.
	November.			December.			January.			February.			March.			April.			May.			June.	July.	Aug.	Sept.	Oct.	
	5-acre field.	10-acre field.	Mean.	5-acre field.	10-acre field.	Mean.	5-acre field.	10-acre field.	Mean.	5-acre field.	10-acre field.	Mean.	5-acre field.	10-acre field.	Mean.	5-acre field.	10-acre field.	Mean.	5-acre field.	10-acre field.	Mean.	Mixed; 5 and 10-acre fields.	Mixed; 5 and 10-acre fields.	Mixed; 5 and 10-acre fields.	Mixed; 5 and 10-acre fields.	Mixed; 5 and 10-acre fields.	
Number of Analyses –	2	2	4	2	2	4	2	2	4	2	2	4	2	2	4	1	1	2	2	1	3	2	2	2	2	2	35
Organic matter. In solution –	Grs. 7·64	Grs. 7·50	Grs. 7·57	Grs. 7·86	Grs. 7·66	Grs. 7·76	Grs. 8·70	Grs. 9·40	Grs. 9·05	Grs. 5·90	Grs. 4·35	Grs. 5·12	Grs. 6·80	Grs. 6,80	Grs. 6·80	Grs. 6·80	Grs. 6·35	Grs. 6·58	Grs. 7·05	Grs. 7·50	Grs. 7·28	Grs. 7·83	Grs. 9·05	Grs. 11·45	Grs. 8·90	Grs. 11·40	Grs. 8·23
Organic matter. In suspension –	26·85	18·81	22·83	20·32	20·42	20·37	14·45	18·48	16·47	19·98	21·95	20·97	24·55	9·15	17·00	22·35	13·75	18·05	17·08	20·60	18·84	23·07	29·40	29·35	53·95	44·10	26·20
Organic matter. Total –	34·49	26·31	30·40	28·18	28·08	28·13	23·15	27·88	25·52	25·88	26·30	26·09	31·65	15·95	23·80	29·15	20·10	24·63	24·13	28·10	26·12	30·90	38·45	40·80	62·85	55·50	34·43
Inorganic matter. In solution –	32·38	34·00	33·19	32·60	29·95	31·27	32·55	29·10	30·82	29·93	30·83	30·38	33·88	30·55	32·22	32·85	26·20	29·52	39·78	42·80	41·29	41·93	44·70	46·30	50·85	53·80	38·86
Inorganic matter. In suspension –	39·17	22·85	31·01	29·35	26·62	27·99	28·43	29·53	28·98	37·10	29·82	33·46	45·40	16·28	30·84	33·25	30·40	31·83	22·50	18·50	20·50	33·57	28·60	29·10	93·30	50·10	36·60
Inorganic matter. Total –	71·55	56·85	64·20	61·95	56·57	59·26	60·98	58·63	59·80	67·03	60·65	63·84	79·28	46·83	63·06	66·10	56·60	61·35	62·28	61·30	61·79	75·50	73·30	75·40	144·15	103·90	75·46
Total in solution – –	40·02	41·50	40·76	40·46	37·61	39·03	41·25	38·50	39·87	35·83	35·18	35·50	40·68	37·35	39·02	39·65	32·55	36·10	46·83	50·30	48·57	49·76	53·75	57·75	59·75	65·20	47·09
Total in suspension – –	66·02	41·66	53·84	49·67	47·04	48·36	42·88	48·01	45·45	57·08	51·77	54·43	70·25	25·43	47·84	55·60	44·15	49·88	39·58	39·10	39·34	56·64	58·00	58·45	147·25	94·20	62·80
Total solid matter –	106·04	83·16	94·60	90·13	84·65	87·39	84·13	86·51	85·32	92·91	86·95	89·93	110·93	62·78	86·86	95·25	76·70	85·98	86·41	89·40	87·91	106·40	111·75	116·20	207·00	159·40	109·89
Ammonia. In solution –	4·88	4·93	4·90	4·63	3·51	3·77	2·09	2·22	2·16	3·82	3·85	3·84	5·13	4·89	5·01	4·68	3·41	4·05	6·41	6·40	6·41	6·50	6·85	7·11	8·81	9·07	5·70
Ammonia. In suspension –	2·12	1·68	1·90	1·54	1·34	1·44	1·26	1·30	1·28	1·69	1·81	1·75	2·28	0·98	1·63	1·43	1·63	1·53	1·14	1·28	1·21	1·70	2·88	2·21	3·54	2·91	2·00
Ammonia. Total –	7·00	6·61	6·80	6·57	4·85	5·21	3·35	3·52	3·44	5·51	5·66	5·59	7·41	5·87	6·64	6·11	5·04	5·58	7·55	7·68	7·62	8·20	9·73	9·32	12·35	11·98	7·70

Table XXII.

Results of the Analyses of 8 Samples of Drainage-water collected in the Five-acre Field.

Second Season 1862 ; May—October inclusive.

—	Grains per Gallon.								
	1862.								Mean ; 8 Samples.
	May 8-10.	July 21-26.	August		September		October		
			4-9.	20 and 21.	1 & 2.	22 & 23.	—	13 & 14.	
Sample Numbers	1	2	3	4	5	6	7	8	
Organic matter — In solution	Grains. 5·50	Grains. 10·50	Grains. 8·50	Grains. 6·04	Grains. 6·10	Grains. 6·70	Grains. 8·20	Grains. 5·90	Grains. 7·18
Organic matter — In suspension	*	*	2·49	2·65	1·90	2·70	1·00	0·42	1·40
Organic matter — Total	5·50	10·50	10·99	8·69	8·00	9·40	9·20	6·32	8·58
Inorganic matter — In solution	25·20	31·70	34·21	36·94	39·90	39·00	35·00	34·09	34·50
Inorganic matter — In suspension	*	*	7·48	2·77	0·40	0·90	0·80	2·09	1·81
Inorganic matter — Total	25·20	31·70	41·69	39·71	40·30	39·90	35·80	36·18	36·31
Total in solution	30·70	42·20	42·71	42·98	46·00	45·70	43·20	39·99	41·68
Total in suspension	*	*	9·97	5·42	2·30	3·60	1·80	2·51	3·21
Total solid matter	30·70	42·20	52·68	48·40	48·30	49·30	45·00	42·50	44·89
Ammonia — In solution	0·60	1·03	2·03	1·21	0·39	0·37	0·25	0·54	0·80
Ammonia — In suspension	—	—	0·76	0·23	0·15	0·38	0·23	0·15	0·24
Ammonia — Total	0·60	1·03	2·79	1·44	0·54	0·75	0·48	0·69	1·04

* Too small for estimation.

TABLE XXIII.

RESULTS of the Analyses of 11 Samples of Drainage-water collected in the Ten-acre Field.

Second Season 1862; May—October inclusive.

	GRAINS PER GALLON.											
	1862.											Mean; 11 Samples.
	May		June 2–4.	July		August		September		October		
	5–7.	19–21.		7–12.	21–26.	4–9.	18 & 19.	1 & 2.	22 & 23.	—	13 & 14.	
Sample Numbers	1	2	3	4	5	6	7	8	9	10	11	
Organic matter — In solution	Grains. 5·70	Grains. 7·60	Grains. 9·30	Grains. 5·10	Grains. 9·90	Grains. 6·16	Grains. 8·92	Grains. 7·40	Grains. 7·10	Grains. 11·41	Grains. 7·50	Grains. 7·83
Organic matter — In suspension	*	*	*	*	*	2·13	0·59	1·20	4·20	2·87	4·30	1·39
Organic matter — Total	5·70	7·60	9·30	5·10	9·90	8·29	9·51	8·60	11·30	14·28	11·80	9·22
Inorganic matter — In solution	33·30	36·80	37·30	33·70	32·90	31·02	38·38	46·30	42·00	38·33	38·10	37·10
Inorganic matter — In suspension	*	*	*	*	*	10·81	5·88	8·70	6·90	6·01	2·80	3·74
Inorganic matter — Total	33·30	36·80	37·30	33·70	32·90	41·83	44·26	55·00	48·90	44·34	40·90	40·84
Total in solution	39·00	44·40	46·60	38·80	42·80	37·18	47·30	53·70	49·10	49·74	45·60	44·93
Total in suspension	*	*	*	*	*	12·94	6·47	9·90	11·10	8·88	7·10	5·13
Total solid matter	39·00	44·40	46·60	38·80	42·80	50·12	53·77	63·60	60·20	58·62	52·70	50·06
Ammonia — In solution	1·45	1·64	1·52	1·66	1·66	2·25	1·68	3·79	1·57	1·92	1·18	1·85
Ammonia — In suspension	—	—	—	—	—	0·39	0·60	0·60	1·04	0·54	0·45	0·33
Ammonia — Total	1·45	1·64	1·52	1·66	1·66	2·64	2·28	4·39	2·61	2·46	1·63	2·18

* Too small for estimation.

Table XXIV.

Comparative and average Composition of the Drainage-water collected in the Two Fields.

Second Season 1862; May—October inclusive.

—	Grains per Gallon.												
	1862.												Average for the 6 Months in the 2 Fields.
	May.		June.		July.		August.		September.		October.		
	5-acre Field.	10-acre Field.	5-acre Field.	10-acre Field.	5-acre Field.	10-acre Field.	5-acre Field.	10-acre Field.	5-acre Field.	10-acre Field.	5-acre Field.	10-acre Field.	
Number of Analyses	1	2	†	1	1	2	2	2	2	2	2	2	19
	Grains.	Grains.		Grains.	Grains.	Grains.	Grains.	Grains.	Grains.	Grains.	Grains.	Grains.	Grains.
Organic matter. In solution	5·50	6·65		9·30	10·50	7·50	7·27	7·54	6·40	7·25	7·05	9·45	7·67
Organic matter. In suspension	*	*		*	*	*	2·57	1·36	2·30	2·70	0·71	3·59	1·20
Organic matter. Total	5·50	6·65		9·30	10·50	7·50	9·84	8·90	8·70	9·95	7·76	13·04	8·87
Inorganic matter. In solution	25·20	35·05		37·30	31·70	33·30	35·58	34·70	39·45	44·15	34·54	38·21	35·38
Inorganic matter. In suspension	*	*		*	*	*	5·12	8·35	0·65	7·80	1·45	4·41	2·53
Inorganic matter. Total	25·20	35·05		37·30	31·70	33·30	40·70	43·05	40·10	51·95	35·99	42·62	37·91
Total in solution	30·70	41·70		46·60	42·20	40·80	42·85	42·24	45·85	51·40	41·59	47·66	43·05
Total in suspension	*	*		*	*	*	7·69	9·71	2·95	10·50	2·16	8·00	3·73
Total solid matter	30·70	41·70		46·60	42·20	40·30	50·54	51·95	48·80	61·90	43·75	55·66	46·78
Ammonia. In solution	0·60	1·55		1·52	1·03	1·66	1·62	1·97	0·38	2·68	0·40	1·55	1·36
Ammonia. In suspension	—	—		—	—	—	0·50	0·49	0·27	0·82	0·19	0·50	0·25
Ammonia. Total	0·60	1·55		1·52	1·03	1·66	2·12	2·46	0·65	3·50	0·59	2·05	1·61

* Too small for estimation.

† No Analysis.

Table XXV.

Results of the Analyses of 21 Samples of Drainage-water collected in the Five-acre Field.

Third Season 1862–3 ; November 1862—October 1863 inclusive.

—	Grains per Gallon.																					
	1862.				1863.																	Mean; 21 Samples.
	November		December		January		February		March		April	May	June		July		Aug.	September		October.		
	6–8.	20–22.	4–6.	18–20.	8–10.	22–24.	5–7.	19–21.	2, and 4–7.	16, and 18 21.	6, 8, and 9.	18–20.	1–6.	15–17.	6, 8, and 10.	20–22.	3–5.	7–9.	21–23.	5–7.	19, 21, and 24.	
Sample numbers -	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	
	Gns.	Gns.	Gns.	Gns.	Gns.	Gns.	Gns.	Gns.	Gns.	Gns.	Gns.	Gns.	Gns.	Gns.	Gns.	Gns.	Gns.	Gns.	Gns.	Gns.	Gns.	Gns.
Organic matter. In solution -	5·65	7·59	9·91	9·25	9·05	9·10	10·60	5·65	4·25	4·20	5·40	10·25	10·30	5·70	11·00	8·20	5·80	6 30	6·00	7·30	5·20	7·46
Organic matter. In suspension	0·47	1·36	2·22	1·30	2·30	*	0·40	0·20	*	*	..	2·25	0·35	0·85	2·95	3·30	7·80	0·10	1·00	1·00	1·70	1·41
Organic matter. Total -	6·12	8·95	12·13	10·55	11·35	9·10	11·00	5·85	4·25	4·20	5·40	12·50	10·65	6·55	13·95	11·50	13·60	6·40	7·00	8·30	6·90	8·87
Inorganic matter. In solution -	39·35	38·89	36·02	35·50	29·25	33·10	32·00	34·25	36·80	36·75	34·50	39·30	41·75	35·00	44·30	36·80	44·10	37·20	49·10	49·00	46·60	38·55
Inorganic matter. In suspension	1·58	10·33	2·10	0·30	0·60	*	2·90	1·65	*	*	0·15	2·20	0·20	0·35	4·95	4·80	3·10	2·70	3·20	1·20	2·60	2·14
Inorganic matter. Total -	40·93	49·22	38·12	35·80	29·85	33·10	34·90	35·90	36·80	36·75	34·65	41·50	41·95	35·35	49·25	41·60	47·20	39·90	52·30	50·20	49·20	40·69
Total in solution -	45·00	46·48	45·93	44·75	38·30	42·20	42·60	39·90	41·05	40·95	39·90	49·55	52·05	40·70	55·30	45·00	49·90	43·50	55·10	56·30	51·80	46·01
Total in suspension -	2·05	11·69	4·32	1·60	2·90	*	3·30	1·85	*	*	0·15	4·45	0·55	1·20	7·90	8·10	10·90	2·80	4·20	2·20	4·30	3·55
Total solid matter-	47·05	58·17	50·25	46·35	41·20	42·20	45·90	41·75	41·05	40·95	40·05	54·00	52·60	41·90	63·20	53·10	60·80	46·30	59·30	58·50	56·10	49·56
Ammonia. In solution -	0·33	0·94	1·55	0·94	0·89	0·17	0·85	1·37	0·40	0·64	0·33	1·70	0·43	0·40	0·50	0·90	0·31	0·17	0·30	0·30	0·97	0·69
Ammonia. In suspension	none	0·62	0·04?	0·14	0·19	..	0·32	0·10	..	..	..	..	0·34?	0·03	0·27	0·13	0·07	0·13	0·50	0·27	0·08	0·15
Ammonia. Total -	0·33	1·56	1·59	1·08	1·08	0·17	1·17	1·47	0·40	0·64	0·33	1·70	0·77	0·43	0·77	1·03	0·38	0·30	0·80	0·57	1·05	0·84

* Too small for estimation.

Table XXVI.

Results of the Analyses of 22 Samples of Drainage-water collected in the Ten-acre Field.

Third Season 1862–3; November 1862—October 1863 inclusive.

	Grains per Gallon.																						
	1862.				1863.																		Mean; 22 Samples.
	November		December		January		February		Mar.	April	May		June		July		August		September		October		
	3–5.	17–19.	1–3.	15–17.	5–7.	19–21.	2–4.	16–18.	3.	7.	7 & 8.	14 & 15.	1–6.	18 & 19.	7 & 9.	23&24.	6 & 7.	20&21.	10&11.	24&25.	8 & 9.	21–24.	
Sample Numbers -	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	
	Gns.	Gns.	Gns.	Gns.	Gns.	Gns.	Gns.	Gns.	Gns.	Gns.	Gns.	Gns.	Gns.	Gns.	Gns.	Gns.	Gns.	Gns.	Gns.	Gns.	Gns.	Gns.	Gns.
Organic matter. In solution -	10·20	10·20	6·90	7·40	7·90	10·40	5·65	5·50	6·10	5·25	8·80	9·20	7·75	8·50	9·90	8·50	8·60	10·30	7·50	6·30	8·00	6·70	7·98
Organic matter. In suspension	1·85	0·79	4·45	2·32	1·00	1·20	1·95	5·80	1·60	1·85	8·45	0·60	3·90	1·50	3·40	2·50	3·90	5·70	5·00	2·90	6·60	5·10	3·29
Organic matter. Total -	12·05	10·99	11·35	9·72	8·90	11·60	7·60	11·30	7·70	7·10	17·25	9·80	11·65	10·00	13·30	11·00	12·50	16·00	12·50	9·20	14·60	11·80	11·27
Inorganic matter. In solution -	36·60	35·60	38·15	38·40	33·30	33·60	34·05	33·85	34·45	33·40	43·80	45·30	46·75	38·90	50·10	47·20	52·10	31·40	53·20	54·25	53·40	42·00	41·35
Inorganic matter. In suspension	4·20	6·11	4·35	2·10	6·80	2·40	2·85	7·25	3·35	1·90	7·45	0·95	1·20	4·35	6·25	6·00	0·50	6·80	1·90	2·65	5·10	2·10	3·94
Inorganic matter. Total -	40·80	41·71	42·50	40·50	40·10	36·00	36·90	41·10	37·80	35·30	51·25	46·25	47·95	43·25	56·35	53·20	52·60	38·20	55·10	56·90	58·50	44·10	45·29
Total in solution -	46·80	45·80	45·05	45·80	41·20	44·00	39·70	39·35	40·55	38·65	52·60	54·50	54·50	47·40	60·00	55·70	60·70	41·70	60·70	60·55	61·40	48·70	49·33
Total in suspension -	6·05	6·90	8·80	4·42	7·80	3·60	4·80	13·05	4·95	3·75	15·90	1·55	5·10	5·85	9·65	8·50	4·40	12·50	6·90	5·55	11·70	7·20	7·23
Total solid matter -	52·85	52·70	53·85	50·22	49·00	47·60	44·50	52·40	45·50	42·40	68·50	56·05	59·60	53·25	69·65	64·20	65·10	54·20	67·60	66·10	73·10	55·90	56·56
Ammonia. In solution -	1·14	3·40	1·47	1·43	1·08	0·80	1·17	1·50	1·12	0·46	3·87	2·11	3·11	2·00	1·64	1·67	1·95	0·50	2·37	2·06	3·75	2·09	1·85
Ammonia. In suspension	0·75	0·29	0·67	0·13	0·19	0·31	0·20	0·19	0·19	0·19	0·55	..	0·10	0·07	0·57	0·13	0·19	0·37	0·43	0·20	0·89	0·12	0·31
Ammonia. Total -	1·89	3·69	2·14	1·56	1·27	1·11	1·37	1·69	1·31	0·65	4·42	2·11	3·21	2·07	2·21	1·80	2·14	0·87	2·80	2·26	4·64	2·21	2·16

Table XXVII.

Comparative and Average Composition of the Drainage-water collected in the Two Fields.

Third Season 1862–3; November 1862—October 1863 inclusive.

—	Grains per Gallon.																								
	1862.				1863.																				Average for the 12 months in the two fields.
	November.		December.		January.		February.		March.		April.		May.		June.		July.		August.		September.		October.		
	5-acre Field.	10-acre Field.	5-acre Field.	10-acre Field.	5-acre Field.	10-acre Field.	5-acre Field.	10-acre Field.	5-acre Field.	10-acre Field.	5-acre Field.	10-acre Field.	5-acre Field.	10-acre Field.	5-acre Field.	10-acre Field.	5-acre Field.	10-acre Field.	5-acre Field.	10-acre Field.	5-acre Field.	10-acre Field.	5-acre Field.	10-acre Field.	
Number of Analyses -	2	2	2	2	2	2	2	2	2	1	1	1	1	2	2	2	2	2	1	2	2	2	2	2	43
Organic matter. In solution -	Gns. 6·62	Gns. 10·20	Gns. 9·58	Gns. 7·15	Gns. 9·08	Gns. 9·15	Gns. 8·13	Gns. 5·58	Gns. 4·22	Gns. 6·10	Gns. 5·40	Gns. 5·25	Gns. 10·25	Gns. 9·00	Gns. 8·00	Gns. 8·13	Gns. 9·60	Gns. 9·20	Gns. 5·86	Gns. 9·45	Gns. 6·15	Gns. 6·90	Gns. 6·25	Gns. 7·35	Gns. 7·61
In suspension	0·92	1·32	1·76	3·39	1·15	1·10	0·30	3·87	..	1·60	..	1·85	2·25	4·53	0·60	2·70	3·12	2·95	7·80	4·80	0·55	3·95	1·35	5·85	2·40
Total -	7·54	11·52	11·34	10·54	10·23	10·25	8·43	9·45	4·22	7·70	5·40	7·10	12·50	13·53	8·60	10·83	12·72	12·15	13·60	14·25	6·70	10·85	7·60	13·20	10·01
Inorganic matter. In solution -	39·12	36·10	35·76	38·28	31·17	33·45	33·12	33·95	36·78	34·45	34·50	33·40	39·30	44·55	38·37	42·82	40·55	48·65	44·10	41·75	43·15	53·72	47·80	47·70	39·69
In suspension	5·95	5·16	1·20	3·22	0·30	4·60	2·28	5·05	..	3·35	0·15	1·90	2·20	4·20	0·28	2·78	4·88	6·13	3·10	3·65	2·95	2·28	1·90	3·60	2·96
Total -	45·07	41·26	36·96	41·50	31·47	38·05	35·40	39·00	36·78	37·80	34·65	35·30	41·50	48·75	38·65	45·60	45·43	54·78	47·20	45·40	46·10	56·00	49·70	51·30	42·65
Total in solution -	45·74	46·30	45·34	45·43	40·25	42·60	41·25	39·53	41·00	40·55	39·90	38·65	49·55	53·55	46·37	50·95	50·15	57·85	49·90	51·20	49·30	60·62	54·05	55·05	47·30
Total in suspension -	6·87	6·48	2·96	6·61	1·45	5·70	2·58	8·92	..	4·95	0·15	3·75	4·45	8·73	0·88	5·48	8·00	9·08	10·90	8·45	3·50	6·23	3·25	9·45	5·36
Total solid matter -	52·61	52·78	48·30	52·04	41·70	48·30	43·83	48·45	41·00	45·50	40·05	42·40	54·00	62·28	47·25	56·43	58·15	66·93	60·80	59·65	52·80	66·85	57·30	64·50	52·66
Ammonia. In solution -	0·64	2·27	1·25	1·45	0·53	0·94	1·11	1·34	0·52	1·12	0·33	0·46	1·70	2·99	0·41	2·55	0·70	1·66	0·31	1·23	0·24	2·21	0·63	2·92	1·23
In suspension	0·31	0·52	0·09	0·40	0·10	0·25	0·21	0·19	..	0·19	..	0·19	..	0·28	0·19	0·09	0·20	0·35	0·07	0·28	0·31	0·32	0·18	0·51	0·22
Total -	0·95	2·79	1·34	1·85	0·63	1·19	1·32	1·53	0·52	1·31	0·33	0·65	1·70	3·27	0·60	2·64	0·90	2·01	0·38	1·51	0·55	2·53	0·81	3·43	1·45

Table XXVIII.

Details of the Sampling, and of the Determinations of Dry Substance and Mineral Matter (Ash), in the Unsewaged and in the Sewaged Meadow Grass.

Second Season, 1862.

Fields.	Plots.	Number of Samples taken.	Particulars of Sampling. Weights. In Fresh State. Each Sample.	In Fresh State. Total.	Air-dried. Total.	Air-dried. Taken.	Determinations of Dry Substance and Mineral Matter (Ash). Actual Weights. Air-dried.	Equal in Fresh State.	Dry Substance (at 212° Fahr.)	Mineral Matter (Ash).	Per-centages. Dry in Fresh. Each Experᵗ.	Dry in Fresh. Mean.	Ash in Fresh. Each Experᵗ.	Ash in Fresh. Mean.	Ash in Dry. Each Experᵗ.	Ash in Dry. Mean.
First Crop.																
			lbs.	*lbs.*	*lbs.*	*ozs.*	*ozs.*	*ozs.*	*ozs.*	*ozs.*						
Five-acre	1 (Unsewaged)	44	2½	110	35	0	12·5	39·286	10·474	0·946	26·66	26·67	2·408	2·406	9·032	9·020
							12·5	39·286	10·480	0·944	26·68		2·403		9·008	
	2 (Sewaged)	25	5	125	32	8	12·5	48·077	10·930	0·920	22·73	22·75	1·914	1·920	8·417	8·442
							12·5	48·077	10·940	0·926	22·76		1·926		8·464	
	3 (Sewaged)	17	5	85	14	10	12·5	72·650	10·440	1·010	14·37	14·41	1·390	1·390	9·674	9·651
							12·5	72·650	10·490	1·010	14·44		1·390		9·628	
	4 (Sewaged)	23	5	115	20	13	12·5	69·069	10·537	0·974	15·26	15·28	1·410	1·424	9·244	9·322
							12·5	69·069	10·565	0·993	15·30		1·438		9·399	
	0* (Unsewaged)	27	2½	67½	17	0	12·5	49·632	10·750	0·966	21·66	21·64	1·946	1·946	8·986	8·995
							12·5	49·632	10·730	0·966	21·62		1·940		9·003	
	0* (Unsewaged)	8	2½	20	5	12	12·5	43·478	10·256	1·015	23·59	23·62	2·335	2·345	9·897	9·929
							12·5	43·478	10·280	1·024	23·64		2·355		9·961	
Ten-acre	1 (Unsewaged)	34	2½	85	26	8	12·5	40·094	10·780	1·013	26·89	26·86	2·527	2·520	9·397	9·380
							12·5	40·094	10·755	1·007	26·82		2·512		9·363	
	2 (Sewaged)	20	5	100	22	12	12·5	54·945	10·753	1·010	19·57	19·52	1·838	1·835	9·393	9·398
							12·5	54·945	10·700	1·006	19·47		1·831		9·402	
	3 (Sewaged)	14	5	70	11	4	12·5	77·778	10·470	1·190	13·46	13·51	1·530	1·537	11·366	11·370
							12·5	77·778	10·550	1·200	13·56		1·543		11·374	
	4 (Sewaged)	10	5	50	7	14	12·5	79·365	10·420	1·293	13·13	13·13	1·629	1·634	12·409	12·443
							12·5	79·365	10·420	1·300	13·13		1·638		12·476	
	0* (Unsewaged	13	2½	32½	3	8	12·5	116·071	11·070	1·020	9·54	†9·54	0·879	†0·880	9·214	9·221
							12·5	116·071	11·076	1·022	9·54		0·880		9·227	

* Designated Plot "0" when unmeasured land.

† Although this result is very low, no error in the experiment can be traced; and as most of the samples contributing to it were taken very early in the season, and during wet weather, it is possibly correct.

Table XXVIII.—*continued.*

Details of the Sampling, and of the Determinations of Dry Substance and Mineral Matter (Ash), in the Unsewaged and in the Sewaged Meadow Grass.

Second Season, 1862.

Particulars of Sampling.							Determinations of Dry Substance and Mineral Matter (Ash).									
			Weights.				Actual Weights.				Per-centages.					
Fields.	Plots.	Number of Samples taken.	In Fresh State.		Air-dried.		Air-dried.	Equal in Fresh State.	Dry Substance (212° Fahr.)	Mineral Matter (Ash).	Dry in Fresh.		Ash in Fresh.		Ash in Dry.	
			Each Sample.	Total.	Total.	Taken.					Each Experᵗ.	Mean.	Each Experᵗ.	Mean.	Each Experᵗ.	Mean.
							Second Crop.									
			lbs.	*lbs.*	*lbs. ozs.*	*ozs.*	*ozs.*	*ozs.*	*ozs.*	*ozs.*						
Five-acre	1 (Unsewaged)	8	2½	20	5 8	50	12·5	45·455	10·338	0·930	22·74	22·75	2·046	2·046	8·996	8·993
							12·5	45·455	10·345	0·930	22·76		2·046		8·990	
	2 (Sewaged)	14	5	70	12 10	50	12·5	69·307	9·986	1·180	14·41	14·81	1·703	1·717	11·817	12·004
							12·5	69·307	9·843	1·200	14·20		1·731		12·191	
	3 (Sewaged)	16	5	80	16 0	50	12·5	62·500	10·278	1·070	16·44	16·42	1·712	1·704	10·411	10·376
							12·5	62·500	10·250	1·060	16·40		1·696		10·341	
	4 (Sewaged)	10	5	50	12 0	50	12·5	52·083	10·085	1·043	19·36	19·39	2·003	2·015	10·342	10·390
							12·5	52·083	10·108	1·055	19·41		2·026		10·437	
	0* (Unsewaged)	30	2½	75	19 6	50	12·5	48·387	10·189	1·256	21·06	21·06	2·596	2·580	12·527	12·249
							12·5	48·387	10·189	1·240	21·06		2·563		12·170	
Ten-acre	1 (Unsewaged)	15	2½	37½	8 4	50	12·5	56·812	10·150	1·200	17·87	17·99	2·112	2·091	11·823	11·683
							12·5	56·812	10·188	1·176	17·93		2·070		11·543	
	2 (Sewaged)	8	5	40	8 0	50	12·5	62·500	10·085	1·160	16·14	16·15	1·856	1·859	11·502	11·512
							12·5	62·500	10·095	1·163	16·15		1·861		11·521	
	3 (Sewaged)	6	5	30	6 6	50	12·414†	58·419	11·180†	1·126	19·14	18·96	1·927	1·917	10·072	10·115
							12·5	58·824	11·046	1·122	18·78		1·907		10·158	
	4 (Sewaged)	13	5	65	12 14	50	12·5	63·107	10·560	1·066	16·73	16·73	1·689	1·685	10·095	10·071
							12·5	63·107	10·550	1·060	16·72		1·680		10·047	

* Designated Plot "0" when unmeasured land.

† 0·036 oz. of dirt was found in this sample, and that weight is therefore deducted.

Table XXVIII.—*continued.*

Details of the Sampling, and of the Determinations of Dry Substance and Mineral Matter (Ash), in the Unsewaged and in the Sewaged Meadow Grass.

Second Season, 1862.

Particulars of Sampling.							Determinations of Dry Substance and Mineral Matter (Ash).									
			Weights.				Actual Weights.				Per-centages.					
Fields.	Plots.	Number of Samples taken.	In Fresh state.		Air-dried.		Air-dried.	Equal in Fresh state.	Dry Substance (at 212° Fahr.)	Mineral Matter (Ash).	Dry in Fresh.		Ash in Fresh.		Ash in Dry.	
			Each Sample.	Total.	Total.	Taken.					Each Experᵗ.	Mean.	Each Experᵗ.	Mean.	Each Experᵗ.	Mean.
Third Crop.*																
			lbs.	*lbs.*	*lbs. ozs.*	*ozs.*	*ozs.*	*ozs.*	*ozs.*	*ozs.*						
Five-acre	2 (Sewaged)	5	5	25	5 10	50	12·5	55·556	10·090	1·345	18·16	18·24	2·421	2·417	12·330	13·247
							12·5	55·556	10·180	1·340	18·32		2·412		13·163	
	3 (Sewaged)	8	5	40	6 8	50	12 5	76·923	9·918	1·390	12·89	12·89	1·807	1·807	14·015	14·017
							12·5	76·923	9·916	1·390	12·89		1·807		14·018	
	4 (Sewaged)	15	5	75	13 3	50	12·5	71·090	10·094	1·274	14·20	14·19	1·792	1·797	12·621	12·665
							12·5	71·090	10·072	1·280	14·17		1·801		12·708	
Ten-acre	2 (Sewaged)	5	5	25	4 10	50	12·5	67·568	9·810	1·240	14·52	14·52	1·835	1·832	12·640	12·624
							12·5	67·568	9·804	1·236	14·51		1·829		12·607	
	3 (Sewaged)	10	5	60	11 0	50	12·5	68·182	9·890	1·170	14·51	14·44	1·716	1·731	11·830	11·987
		1	10				12·5	68·182	9·800	1·190	14·37		1·745		12·143	
	4 (Sewaged)	9	5	45	8 12	50	12·5	64·286	10·146	1·200	15·78	15·80	1·867	1·908	11·827	12·078
							12·5	64·286	10·164	1·253	15·81		1·949		12·328	
Fourth Crop.																
Ten-acre	4 (Sewaged)	2	5	20	8 8	50	12·5	29·412	9·938	1·284	33·79	33·80	4·367	4·390	12·920	12·989
		1	10				12·5	29·412	9·940	1·298	33·80		4·413		13·058	

* A sample was also taken from Plot 1 in the 10-acre field, but very late in the season, and it contained so much of fallen leaves (from trees) that the analysis was not proceeded with.

Table XXIX.

Details of the Sampling, and of the Determinations of Dry Substance and Mineral Matter (Ash), in the Unsewaged and in the Sewaged Meadow Grass and Rye-grass.

Third Season, 1863.

Fields.	Plots.	Number of Samples taken.	Particulars of Sampling. Weights. In fresh state. Each Sample.	In fresh state. Total.	Air-dried. Total.	Air-dried. Taken.	Determinations of Dry Substance and Mineral Matter (Ash). Actual Weights. Air-dried.	Equal in fresh state.	Dry Substance (at 212° Fahr.)	Mineral Matter (Ash).	Per-centages. Dry in Fresh. Each Expert.	Dry in Fresh. Mean.	Ash in Fresh. Each Expert.	Ash in Fresh. Mean.	Ash in Dry. Each Expert.	Ash in Dry. Mean.
First Crop.																
			lbs.	*lbs.*	*lbs.* *ozs.*	*ozs.*	*ozs.*	*ozs.*	*ozs.*	*ozs.*						
Five-acre	1 (Unsewaged)	6	2½	15	6 1	50	12·5	30·925	11·153	0·820	36·06	36·10	2·652	2·878	7·352	7·972
							12·5	30·925	11·175	0·960	36·14		3·104		8·591	
	2 (Sewaged)	11	5	55	13 8	50	12·5	50·926	10·937	1·006	21·48	21·49	1·975	1·973	9·198	9·187
							12·5	50·926	10·942	1·004	21·49		1·971		9·176	
	3 (Sewaged)	8	5	40	8 1	50	12·5	62·012	10·885	1·100	17·55	17·59	1·774	1·782	10·106	10·129
							12·5	62·012	10·935	1·110	17·63		1·790		10·151	
	4 (Sewaged)	10	5	50	9 5	50	12·5	67·115	10·925	1·100	16·28	16·26	1·639	1·662	10·069	10·218
							12·5	67·115	10·901	1·130	16·24		1·684		10·366	
	0* (Unsewaged)	5	2½	12½	3 2½	50	12·5	49·509	11·205	1·050	22·63	22·75	2·121	2·134	9·371	9·382
							12·5	49·509	11·318	1·063	22·86		2·147		9·392	
	00* (Sewaged)	1	5	5	1 2½	18½	4·563	19·996	4·090	0·340	20·45	20·49	1·700	1·705	8·313	8·322
							4·563	19·996	4·105	0·342	20·53		1·710		8·331	
Ten-acre	1 (Unsewaged)	12	2½	30	13 4	50	12·5	28·302	11·274	0·807	39·83	39·79	2·851	2·899	7·158	7·286
							12·5	28·302	11·249	0·834	39·75		2·947		7·414	
	2 (Sewaged)	8	5	40	8 7	50	12·5	59·256	10·972	0·909	18·52	18·56	1·534	1·545	8·285	8·325
							12·5	59·256	11·024	0·922	18·60		1·556		8·364	
	3 (Sewaged)	8	5	40	9 2	50	12·5	54·795	10·966	1·096	20·01	20·03	2·000	1·999	9·995	9·983
							12·5	54·795	10·982	1·095	20·04		1·998		9·971	
	4 (Sewaged)	9	5	45	7 9	50	12·5	74·375	10·828	1·144	14·56	14·56	1·538	1·549	10·565	10·639
							12·5	74·375	10·829	1·160	14·56		1·560		10·712	
	0* (Unsewaged)	5	2½	12½	2 6	38	4·75	25·000	4·269	0·370	17·08	17·09	1·480	1·512	8·667	8·850
							4·75	25·000	4·273	0·386	17·09		1·544		9·033	
	0* (Unsewaged)	5	2½	12½	4 14	50	6·25	16·026	5·598	0·486	34·93	34·96	3·033	3·014	8·682	8·621
							6·25	16·026	5·608	0·480	34·99		2·995		8·559	
Rye-grass†	1 (Unsewaged)	6	2½	15	3 12	50	12·5	50·000	10·659	0·976	21·32	21·30	1·952	1·950	9·157	9·157
							12·5	50·000	10·638	0·974	21·28		1·948		9·156	
	0* (Unsewaged)	14	2½	35	8 10	50	12·5	50·725	10·803	0·946	21·30	21·26	1·865	1·859	8·757	8·746
							12·5	50·725	10·763	0·940	21·22		1·853		8·734	

* Unmeasured land; designated Plot 0 when unsewaged, and Plot 00 when sewaged.
† No sewage was applied for the first crop of Plots 2 and 3, and no samples were taken from the Produce.

Table XXIX.—*continued.*

Details of the Sampling, and of the Determinations of Dry Substance and Mineral Matter (Ash), in the Unsewaged and in the Sewaged Meadow Grass and Rye-grass.

Third Season, 1863.

Particulars of Sampling.							Determinations of Dry Substance and Mineral Matter (Ash).							
							Actual Weights.				Per-centages.					
			Weights.								Dry in Fresh.		Ash in Fresh.		Ash in Dry.	
Fields.	Plots.	Number of Samples taken.	In Fresh State.		Air-dried.		Air-dried.	Equal in Fresh State.	Dry Substance (at 212° Fahr).	Mineral Matter (Ash).	Each Experᵗ.	Mean.	Each Experᵗ.	Mean.	Each Experᵗ.	Mean.
			Each Sample.	Total.	Total.	Taken.										
							SECOND CROP.									
			lbs.	*lbs.*	*lbs.*	*ozs.*	*ozs.*	*ozs.*	*ozs.*	*ozs.*						
Five-acre	1 (Unsewaged)	2	2½	10	4	2	50	12·5	30·303	10·420	1·190	34·39	34·42	3·927	3·818	11·420	11·095
		1	5					12·5	30·303	10·437	1·124	34·44		3·709		10·769	
	2 (Sewaged)	6	5	30	6	5	50	12·5	59·401	10·993	1·192	18·51	18·51	2·007	1·997	10·843	10·789
								12·5	59·401	10·993	1·180	18·51		1·987		10·734	
	3 (Sewaged)	9	5	45	7	12	50	12·5	72·881	10·814	1·130	14·90	14·91	1·537	1·564	10·449	10·489
								12·5	72·881	10·823	1·140	14·92		1·571		10·523	
	4 (Sewaged)	4	5	20	4	2	50	12·5	60·606	10·774	1·007	17·78	17·80	1·662	1·561	9·347	8·771
								12·5	60·606	10·800	0·885	17·82		1·460		8·194	
	*0 (Unsewaged)	4	2½	20	5	10	50	12·5	44·444	10·164	1·198	22·87	22·89	2·696	2·694	11·787	11·766
		2	5					12·5	44·444	10·183	1·196	22·91		2·691		11·745	
	*00 (Sewaged)	1	10	10	2	7¾	39·75	9·938	39·992	8·658	0·962	21·65	21·61	2·405	2·403	11·111	11·118
								9·938	39·992	8·629	0·960	21·57		2·400		11·125	
Ten-acre	1 (Unsewaged)	1	2½	7½	1	9½	25·5	6·375	29·995	5·444	0·670	18·15	18·17	2·234	2·242	12·307	12·342
		1	5					6·375	29·995	5·454	0·675	18·18		2·250		12·376	
	2 (Sewaged)	6	5	30	6	1	50	12·5	61·856	10·932	1·160	17·67	17·66	1·875	1·929	10·611	10·920
								12·5	61·856	10·918	1·226	17·65		1·982		11·229	
	3 (Sewaged)	7	5	35	6	8	50	12 5	67·308	10·940	1·230	16·25	16·25	1·827	1·820	11·243	11·199
								12·5	67·308	10·937	1·220	16·25		1·813		11·155	
	4 (Sewaged)	6	5	30	6	7	49·895†	12·474	58·127	10·927	1·120	18·80	18·82	1·927	1·935	10·250	10·280
								12·474	58·127	10·951	1·129	18·84		1·942		10·310	
	*0 (Unsewaged)	1	2½	17½	5	13	50	12·5	37·631	10·009	1·310	26·60	26·53	3·481	3·069	13·088	11·567
		3	5					12·5	37·631	9·954	1·000	26·45		2·657		10·046	
	*00 (Sewaged)	1	10	10	1	15	31	7·75	39·990	6·863	0·746	17·17	17·15	1·865	1·869	10·862	10·898
								7·75	39·990	6·851	0·749	17·13		1·873		10·933	
Rye-grass	1 (Unsewaged)	7	2½	17½	4	12	50	12·5	46·053	10·909	0·876	23·69	23·70	1·902	1·912	8·030	8·069
								12·5	46·053	10·915	0·885	23·70		1·922		8·108	
	2 (Sewaged)	9	5	45	9	10	50	12·5	58·442	11·004	0·922	18·83	18·81	1·578	1·576	8·379	8·378
								12·5	58·442	10·984	0·920	18·79		1·574		8·376	
	3 (Sewaged)	13	5	65	12	15	50	12·5	62·800	10·978	1·044	17·48	17·52	1·662	1·666	9·510	9·514
								12·5	62·800	11·022	1·049	17·55		1·670		9·517	
	*0 (Unsewaged)	8	2½	20	6	6	50	12·5	39·216	10·854	1·050	27·68	27·59	2·677	2·672	9·674	9·688
								12·5	39·216	10·781	1·046	27·49		2·667		9·702	

* Unmeasured land; designated Plot 0 when unsewaged, and Plot 00 when sewaged.

† 0·105 oz. of dirt was found in the sample, and that weight is therefore deducted.

Table XXIX—*continued.*

Details of the Sampling, and of the Determinations of Dry Substance and Mineral Matter (Ash), in the Unsewaged and in the Sewaged Meadow Grass and Rye-grass.

Third Season, 1863.

Particulars of Sampling.						Determinations of Dry Substance and Mineral Matter (Ash).									
			Weights.			Actual Weights.				Per-centages.					
			In fresh state.		Air-dried.					Dry in Fresh.		Ash in Fresh.		Ash in Dry.	
Fields.	Plots.	Number of Samples taken.	Each Sample.	Total.	Total. Taken.	Air-dried.	Equal in fresh State.	Dry Substance (at 212° Fahr.)	Mineral Matter (Ash).	Each Expert.	Mean.	Each Expert.	Mean.	Each Expert.	Mean.
						THIRD CROP.									
			lbs.	*lbs.*	*lbs. ozs.* *ozs.*	*ozs.*	*ozs.*	*ozs.*	*ozs.*						
Five-acre	2 (Sewaged)	5	5	25	5 6 50	12·5	58·140	10·273	1·205	17·67	17·67	2·073	2·046	11·730	11·584
						12·5	58·140	10·265	1·174	17·66		2·019		11·437	
	3 (Sewaged)	5	5	25	3 6 50	12·5	92·593	10·139	1·274	10·95	10·92	1·376	1·374	12·565	12·589
						12·5	92·593	10·070	1·270	10·88		1·372		12·612	
	4 (Sewaged)	6	5	30	6 8 50	12·5	57·692	10·142	1·164	17·58	17·58	2·018	2·023	11·477	11·506
						12·5	57·692	10·143	1·170	17·58		2·028		11·535	
Ten-acre	2 (Sewaged)	5	5	25	3 15 50	12·5	79·355	9·856	1·142	12·42	12·42	1·439	1·448	11·587	11·665
						12·5	79·855	9·845	1·156	12·41		1·457		11·742	
	3 (Sewaged)	6	5	30	5 6 50	12·5	69·767	10·140	1·200	14·53	14·58	1·720	1·734	11·834	11·889
						12·5	69·767	10·206	1·219	14·63		1·747		11·944	
	4 (Sewaged)	8	5	40	7 8 50	12·5	66·667	10·115	1·180	15·17	15·17	1·761	1·761	11·666	11·666
						12·5	66·667	10·115	1·180	15·17		1·761		11·666	
	00*(Sewaged)	1	10	10	2 9½ 41½	10·375	39·996	8·459	0·992	21·15	21·12	2·480	2·478	11·727	11·736
						10·375	39·996	8·430	0·990	21·08		2·475		11·744	
Rye-grass	1 (Unsewaged)	8	2½	20	8 14 50	12·5	28·169	10·240	0·705	36·35	36·35	2·503	2·512	6·885	6·910
						12·5	28·169	10·238	0·710	36·34		2·521		6·935	
	2 (Sewaged)	11	5	55	17 6 50	12·5	39·568	10·871	1·091	27·47	27·47	2·757	2·757	10·036	10·036
						12·5	39·568	10·871	1·091	27·47		2·757		10·036	
	3 (Sewaged)	14	5	70	14 4 50	12·5	61·404	11·227	1·190	18·28	18·28	1·938	1·871	10·599	10·235
						12·5	61·404	11·226	1·108	18·28		1·804		9·870	
	0* (Unsewaged)	9	2½	22½	9 14 50	12·5	28·481	10·396	0·840	36·50	36·48	2·949	2·953	8·080	8·095
						12·5	28·481	10·382	0·842	36·45		2·956		8·110	

* Unmeasured land; designated Plot 0 when unsewaged, and Plot 00 when sewaged.

Table XXIX.—*continued.*

Details of the Sampling, and of the Determinations of Dry Substance and Mineral Matter (Ash), in the Unsewaged and in the Sewaged Meadow Grass and Rye-grass.

Third Season, 1863.

Particulars of Sampling.								Determinations of Dry Substance, and Mineral Matter (Ash).									
								Actual Weights.				Per-centages.					
				Weights.								Dry in Fresh.		Ash in Fresh.		Ash in Dry.	
Fields.	Plots.		Number of Samples taken.	In fresh state.		Air-dried.		Air-dried.	Equal in Fresh State.	Dry Substance (at 212° Fahr.)	Mineral Matter (Ash).	Each Experᵗ.	Mean.	Each Experᵗ.	Mean.	Each Experᵗ.	Mean.
				Each Sample.	Total.	Total.	Taken.										
								FOURTH CROP.*									
				lbs.	*lbs.*	*lbs. ozs.*	*ozs.*	*ozs.*	*ozs.*	*ozs.*	*ozs.*						
Five-acre	2 (Sewaged)		2	10	20	3 13	50	12·5	65·565	10·334	1·235	15·76	15·75	1·884	1·876	11·951	11·909
								12·5	65·565	10·323	1·225	15·74		1·868		11·867	
	3 (Sewaged)		4	5	20	3 3	50	12·5	78·419	10·240	1·295	13·06	13·04	1·651	1·693	12·640	12·984
								12·5	78·419	10·209	1·360	13·02		1·734		13·322	
	4 (Sewaged)		8	5	40	6 1	50	12·5	82·467	10·161	1·150	12·32	12·30	1·394	1·447	11·318	11·764
								12·5	82·467	10·131	1·237	12·28		1·500		12·210	
Ten-acre	3 (Sewaged)		3	5	15	2 9	40·805†	10·201	59·701	8·304	1·035	13·91	13·87	1·733	1·738	12·464	12·531
								10·201	59·701	8·255	1·040	13·83		1·742		12·598	
	4 (Sewaged)		6	5	30	5 0	50	12·5	75·000	10·185	1·270	13·58	13·62	1·693	1·697	12·469	12·457
								12·5	75·000	10·245	1·275	13·66		1·700		12·445	
Rye-grass	1 (Unsewaged)		1	2½	7¼	3 0	47·815‡	11·954	29·885	9·880	1·130	33·06	33·21	3·781	3·798	11·437	11·435
			1	5				11·954	29·885	9·971	1·140	33·36		3·815		11·433	
	2 (Sewaged)		7	5	35	6 0½	50	12·5	72·542	10·035	0·990	13·83	13·84	1·365	1·372	9·865	9·912
								12·5	72·542	10·042	1·000	13·84		1·379		9·958	
	3 (Sewaged)		9	5	45	10 7	50	12·5	53·890	10·176	1·126	18·88	18·89	2·089	2·093	11·065	11·083
								12·5	53·890	10·180	1·130	18·89		2·097		11·100	
	0§ (Unsewaged)		4	2½	25	6 12	50	12·5	46·296	10·032	1·396	21·67	21·66	3·015	3·020	13·915	13·942
			3	5				12·5	46·296	10·022	1·400	21·65		3·024		13·969	

* A sample weighing 20 lbs. was also taken from Plot 2 in the ten-acre field, but very late in the season, and it contained so much of fallen leaves (from trees) that the analysis was not proceeded with.

† 0·195 oz. of dirt was found in this sample, and that weight is therefore deducted.

‡ 0·185 oz. is deducted from this sample for the same reason.

§ Designated Plot 0 when unmeasured land.

Table XXIX.—*continued.*

Details of the Sampling, and of the Determinations of Dry Substance and Mineral Matter (Ash), in the Unsewaged and in the Sewaged Meadow Grass and Rye-grass.

Third Season, 1863.

Particulars of Sampling.								Determinations of Dry Substance and Mineral Matter (Ash).									
			Weights.					Actual Weights.				Per-centages.					
			In fresh state.		Air-dried.							Dry in Fresh.		Ash in Fresh.		Ash in Dry.	
Fields.	Plots.	Number of Samples taken.	Each Sample.	Total.	Total.	Taken.		Air-dried.	Equal in Fresh State.	Dry Substance (at 212° Fahr.)	Mineral Matter (Ash.)	Each Experᵗ.	Mean.	Each Experᵗ.	Mean.	Each Experᵗ.	Mean.
Fifth Crop.*																	
			lbs.	*lbs.*	*lbs.*	*ozs.*		*ozs.*	*ozs.*	*ozs.*	*ozs.*						
Five-acre	4 (Sewaged)	1	20	20	3	11	†49·845	12·461 12·461	67·576 67·576	10·308 10·304	1·352 1·332	15·25 15·25	15·25	2·001 1·971	1·986	13·116 12·927	13·022
Rye-grass	1 (Unsewaged)	1	20	20	4	11	50	12·5 12·5	53·328 53·328	10·620 10·627	1·562 1·570	19·91 19·93	19·92	2·929 2·944	2·937	14·708 14·774	14·741
	2 (Sewaged)	2	5	10	2	0¼	32¼	8·063 8·063	39·995 39·995	6·717 6·682	0·874 0·884	16·79 16·71	16·75	2·185 2·210	2·198	13·012 13·230	13·121
	3 (Sewaged)	5	5	25	5	6	50	12·5 12·5	58·140 58·140	10·345 10·301	1·270 1·260	17·79 17·72	17·76	2·184 2·167	2·176	12·276 12·232	12·254
Sixth Crop.‡																	
Rye-grass	2 (Sewaged)	2	10	20	4	6	50	12·5 12·5	57·143 57·143	10·665 10·642	1·496 1·490	18·66 18·62	18·64	2·618 2·607	2·613	14·027 14·001	14·014
	3 (Sewaged)	2	10	20	4	13½	50	12·5 12 5	51·610 51·610	10·523 10·508	1·540 1·495	20·39 20·36	20·38	2·984 2·897	2·941	14·635 14·227	14·431

* Samples were also taken from Plots 2 and 3 in the 5-acre field, from Plots 3 and 4 in the 10-acre field, and from Plot 0 in the rye-grass field, but very late in the season, and they contained so much of fallen leaves (from trees) and some of them were so wet that the analyses were not proceeded with.

† 0·155 oz. of dirt was found in this sample, and that weight is, therefore, deducted.

‡ A sample was taken from Plot 4 in the 5-acre field, but it contained so much of fallen leaves (from trees) that it was thought better not to proceed with the analysis.

Table XXX.

Summary of the Per-centages of Dry Substance (at 212° Fahr.), and of Mineral Matter (Ash), in the Unsewaged and the Sewaged Meadow Grass.

Second Season, 1862.

Plots.	Per-centages.											
	Dry Substance in Fresh Grass.				Mineral Matter in Fresh Grass.				Mineral Matter in Dry Substance.			
	1st Crop.	2d Crop.	3d Crop.	4th Crop.	1st Crop.	2d Crop.	3d Crop.	4th Crop.	1st Crop.	2d Crop.	3d Crop.	4th Crop.
Five-acre Field.												
1 (Unsewaged) - -	26·7	22·8	..	..	2·41	2·05	..	..	9·02	8·99	..	..
2 (Sewaged) - -	22·8	14·3	18·2	..	1·92	1·72	2·42	..	8·44	12·00	13·25	..
3 (Sewaged) - -	14·4	16·4	12·9	..	1·39	1·70	1·81	..	9·65	10·38	14·02	..
4 (Sewaged) - -	15·3	19·4	14·2	..	1·42	2·02	1·80	..	9·32	10·39	12·67	..
Ten-acre Field.												
1 (Unsewaged) - -	26·9	17·9	..	..	2·52	2·09	..	..	9·38	11·68	..	..
2 (Sewaged) - -	19·5	16·2	14·5	..	1·84	1·86	1·83	..	9·40	11·51	12·62	..
3 (Sewaged) - -	13·5	19·0	14·4	..	1·54	1·92	1·73	..	11·37	10·12	11·99	..
4 (Sewaged) - -	13·1	16·7	15·8	33·8	1·63	1·69	1·91	4·39	12·44	10·07	12·08	12·99

Table XXXI.

Summary of the Per-centages of Dry Substance (at 212° Fahr.), and of Mineral Matter (Ash), in the Unsewaged and the Sewaged Meadow Grass and Rye-grass. Third Season, 1863.

Plots.	Per-centages.																	
	Dry Substance in Fresh Grass.						Mineral Matter in Fresh Grass.						Mineral Matter in Dry Substance.					
	1st Crop.	2d Crop.	3d Crop.	4th Crop.	5th Crop.	6th Crop.	1st Crop.	2d Crop.	3d Crop.	4th Crop.	5th Crop.	6th Crop.	1st Crop.	2d Crop.	3d Crop.	4th Crop.	5th Crop.	6th Crop.
Five-acre Field.																		
1 (Unsewaged) - -	36·1	34·4	..	..	..	..	2·88	3·82	..	..	..	..	7·97	11·10	..	..	..	..
2 (Sewaged) - -	21·5	18·5	17·7	15·8	..	..	1·97	2·00	2·05	1·88	..	..	9·19	10·79	11·58	11·91	..	..
3 (Sewaged) - -	17·6	14·9	10·9	13·0	..	..	1·78	1·56	1·37	1·69	..	..	10·13	10·49	12·59	12·98	..	..
4 (Sewaged) - -	16·3	17·8	17·6	12·3	15·3	..	1·66	1·56	2·02	1·45	1·99	..	10·22	8·77	11·51	11·76	13·02	..
Ten-acre Field.																		
1 (Unsewaged) - -	39·8	18·2	..	..	..	..	2·90	2·24	..	..	..	..	7·29	12·34	..	..	..	..
2 (Sewaged) - -	18·6	17·7	12·4	..	..	..	1·55	1·93	1·45	..	..	..	8·33	10·92	11·67	..	..	..
3 (Sewaged) - -	20·0	16·3	14·6	13·9	..	..	2·00	1·82	1·73	1·74	..	..	9·98	11·20	11·89	12·53	..	..
4 (Sewaged) - -	14·6	18·8	15·2	13·6	..	..	1·55	1·94	1·76	1·70	..	..	10·64	10·28	11·67	12·46	..	..
Rye-Grass.																		
1 (Unsewaged) - -	21·3	23·7	36·4	33·2	19·9	..	1·95	1·91	2·51	3·80	2·04	..	9·16	8·07	6·91	11·44	14·74	..
2 (Sewaged) - -	*	18·8	27·5	13·8	16·8	18·6	*	1·58	2·76	1·37	2·20	2·61	*	8·38	10·04	9·91	13·12	14·01
3 (Sewaged) - -	*	17·5	18·3	18·9	17·8	20·4	*	1·67	1·87	2·09	2·18	2·94	*	9·51	10·24	11·08	12·25	14·43

* No Sewage was applied for the 1st Crop of Plots 2 and 3, and no Samples were taken from the produce.

Table XXXII.

Showing the Composition (per cent.) of the Unsewaged and the Sewaged Meadow Grass in the *Fresh State*, as weighed.

Second Season, 1862.

—	First Crop.						Second Crop.					Third Crop.			Fourth Crop.
	Unsewaged.			Sewaged.			Unsewaged.	Sewaged.				Sewaged.			Sewaged.
	Plot 0*.		Plot 1.	Plot 2.	Plot 3.	Plot 4.	Plot 0*.	Plot 1.	Plot 2.	Plot 3.	Plot 4.	Plot 2.	Plot 3.	Plot 4.	Plot 4.
	(1.)	(2.)													
Five-acre Field.															
Nitrogenous substance (N×6·3)	2·18	1·32	2·39	1·79	1·54	2·31	2·86	1·56	2·48	2·35	2·71	4·35	2·80	2·96	—
Fatty matter (ether extract)	0·56	0·61	0·71	0·54	0·38	0·47	0·83	0·61	0·57	0·67	0·73	0·84	0·51	0·61	—
Woody fibre	6·70	7·08	8·38	7·44	4·69	4·75	6·22	7·05	4·25	4·80	5·68	4·76	3·53	3·80	—
Other non-nitrogenous substances	10·37	11·68	12·66	11·08	6·48	6·42	8·68	11·46	5·31	6·89	8·32	5·92	4·26	5·11	—
Mineral matter (ash)	1·83	2·33	2·58	1·90	1·32	1·33	2·47	2·07	1·70	1·71	1·95	2·37	1·79	1·71	—
Total dry substance	21·64	23·62	26·67	22·75	14·41	15·28	21·06	22·75	14·31	16·42	19·39	18·24	12·89	14·19	—
Water	78·36	76·38	73·33	77·25	85·59	84·72	78·94	77·25	85·69	83·58	80·61	81·76	87·11	85·81	—
	100·00	100·00	100·00	100·00	100·00	100·00	100·00	100·00	100·00	100·00	100·00	100·00	100·00	100·00	—
Ten-acre Field.															
Nitrogenous substance (N×6·3)	0·97		2·61	2·18	2·30	2·87	—	2·23	2·17	2·19	1·80	2·93	2·74	2·69	6·16
Fatty matter (ether extract)	0·24		0·70	0·54	0·42	0·54	—	0·68	0·71	0·66	0·57	0·68	0·66	0·61	1·49
Woody fibre	2·97		8·28	6·44	4·16	5·21	—	4·67	4·47	5·41	5·03	3·79	3·85	4·30	8·40
Other non-nitrogenous substances	4·55		12·79	9·01	5·30	3·56	—	8·22	6·98	8·77	7·67	5·31	5·41	6·39	13·08
Mineral matter (ash)	0·81		2·48	1·35	1·33	0·95	—	2·10	1·82	1·93	1·66	1·81	1·78	1·81	4·67
Total dry substance	9·54		26·86	19·52	13·51	13·13	—	17·90	16·15	18·96	16·73	14·52	14·44	15·80	33·80
Water	90·46		73·14	80·48	86·49	86·87	—	82·10	83·85	81·04	83·27	85·48	85·56	84·20	66·20
	100·00		100·00	100·00	100·00	100·00	—	100·00	100·00	100·00	100·00	100·00	100·00	100·00	100·00

* Designated Plot "0" when unmeasured land.

Table XXXIII.

Showing the Composition (per cent.) of the *Dry Substance* of the Unsewaged and the Sewaged Meadow Grass.
Second Season, 1862.

—	First Crop.						Second Crop.					Third Crop.			Fourth Crop.
	Unsewaged.			Sewaged.			Unsewaged.	Sewaged.				Sewaged.			Sewaged.
	Plot 0.*		Plot 1.	Plot 2.	Plot 3.	Plot 4.	Plot 0.*	Plot 1.	Plot 2.	Plot 3.	Plot 4.	Plot 2.	Plot 3.	Plot 4.	Plot 4.
	(1.)	(2.)													
Five-acre Field.															
Nitrogenous substance (N × 6·3)	10·09	5·59	8·95	7·87	10·66	15·11	13·59	6·86	17·33	14·28	13·96	23·87	21·71	20·89	—
Fatty matter (ether extract)	2·60	2·59	2·68	2·38	2·63	3·10	3·91	2·66	4·00	4·05	3·79	4·62	3·98	4·29	—
Woody fibre	30·97	32·53	31·25	32·08	32·53	31·11	29·54	30·99	29·69	29·26	29·31	26·10	27·37	26·80	—
Other non-nitrogenous substances	47·90	49·45	47·46	48·71	45·00	42·01	41·23	50·38	37·12	41·98	42·90	32·44	33·07	36·00	—
Mineral matter (ash)	8·44	9·84	9·66	8·36	9·18	8·67	11·73	9·11	11·86	10·43	10·04	12·97	13·87	12·02	—
	100·00	100·00	100·00	100·00	100·00	100·00	100·00	100·00	100·00	100·00	100·00	100·00	100·00	100·00	—
Ten-acre Field.															
Nitrogenous substance (N × 6·3)	10·16		9·71	11·17	17·01	21·84	—	12·44	13·46	11·55	10·79	20·19	18·98	17·01	18·22
Fatty matter (ether extract)	2·48		2·61	2·77	3·07	4·10	—	3·78	4·38	3·50	3·41	4·70	4·58	3·86	4·42
Woody fibre	31·13		30·84	33·00	30·81	39·70	—	26·10	27·67	28·52	30·65	26·09	26·62	27·19	24·86
Other non-nitrogenous substances	47·73		47·63	46·16	39·24	27·15	—	45·91	43·22	46·25	45·84	36·55	37·48	40·45	38·70
Mineral matter (ash)	8·50		9·21	6·90	9·87	7·21	—	11·77	11·27	10·18	9·91	12·47	12·34	11·49	13·80
	100·00		100·00	100·00	100·00	100·00	—	100·00	100·00	100·00	100·00	100·00	100·00	100·00	100·00

* Designated Plot 0 when unmeasured land.

Table XXXIV.

Showing the Composition (per cent.) of the Unsewaged and the Sewaged Meadow Grass in the *Fresh State*, as weighed.

Third Season, 1863.

—	First Crop.				Second Crop.				Third Crop.			Fourth Crop.			Fifth Crop.
	Unsewaged.	Sewaged.			Unsewaged.	Sewaged.			Sewaged.			Sewaged.			Sewaged.
	Plot 1.	Plot 2.	Plot 3.	Plot 4.	Plot 1.	Plot 2.	Plot 3.	Plot 4.	Plot 2.	Plot 3.	Plot 4.	Plot 2.	Plot 3.	Plot 4.	Plot 4.
Five-acre Field.															
Nitrogenous substance (N×6·3)	2·75	2·95	3·05	3·95	4·44	3·07	3·04	3·15	3·30	2·46	3·82	4·63	3·30	3·15	4·91
Fatty matter (ether extract)	1·14	1·09	0·95	0·86	1·48	0·98	0·56	0·70	0·95	0·58	0·88	0·59	0·69	0·61	0·77
Woody fibre	10·92	5·38	4·10	3·60	8·87	5·24	4·32	5·57	4·41	2·80	4·38	3·41	3·15	3·00	3·13
Other non-nitrogenous substances	18·65	10·11	7·72	6·07	15·74	7·04	5·41	6·59	6·95	3·69	6·42	5·27	4·31	3·97	4·52
Mineral matter (ash)	2·64	1·96	1·77	1·78	3·89	2·18	1·58	1·79	2·06	1·39	2·08	1·85	1·59	1·57	1·92
Total dry substance	36·10	21·49	17·59	16·26	34·42	18·51	14·01	17·80	17·67	10·92	17·58	15·75	13·04	12·30	15·25
Water	63·90	78·51	82·41	83·74	65·58	81·49	85·09	82·20	82·33	89·08	82·42	84·25	86·96	87·70	84·75
	100·00	100·00	100·00	100·00	100·00	100·00	100·00	100·00	100·00	100·00	100·00	100·00	100·00	100·00	100·00
Ten-acre Field.															
Nitrogenous substance (N×6·3)	3·50	2·40	3·19	2·87	2·17	3·31	3·15	2·92	2·36	2·54	3·02	—	3·54	3·38	—
Fatty matter (ether extract)	1·72	0·94	0·87	0·83	0·82	0·96	0·62	0·65	0·66	0·65	0·70	—	0·70	0·75	—
Woody fibre	12·97	5·52	5·17	3·43	4·72	4·72	4·47	5·66	3·24	3·90	4·26	—	3·17	3·21	—
Other non-nitrogenous substances	18·65	8·13	8·81	5·81	8·16	6·56	6·12	7·63	4·66	5·79	5·38	—	4·75	4·55	—
Mineral matter (ash)	2·95	1·57	1·99	1·62	2·30	2·11	1·89	1·96	1·50	1·70	1·81	—	1·71	1·73	—
Total dry substance	39·79	18·56	20·03	14·56	18·17	17·66	16·25	18·82	12·42	14·58	15·17	—	13·87	13·62	—
Water	60·21	81·44	79·97	85·44	81·83	82·34	83·75	81·18	87·58	85·42	84·83	—	86·13	86·38	—
	100·00	100·00	100·00	100·00	100·00	100·00	100·00	100·00	100·00	100·00	100·00	—	100·00	100·00	—

Table XXXV.

Showing the Composition (per cent.) of the *Dry Substance* of the Unsewaged and the Sewaged Meadow Grass.

Third Season, 1863.

—	First Crop.				Second Crop.				Third Crop.			Fourth Crop.			Fifth Crop.
	Unsewaged.	Sewaged.			Unsewaged.	Sewaged.			Sewaged.			Sewaged.			Sewaged.
	Plot 1.	Plot 2.	Plot 3.	Plot 4.	Plot 1.	Plot 2.	Plot 3.	Plot 4.	Plot 2.	Plot 3.	Plot 4.	Plot 2.	Plot 3.	Plot 4.	Plot 4.
Five-acre Field.															
Nitrogenous substance (N×6·3)	7·62	13·71	17·33	24·31	12·88	16·57	20·88	17·71	18·66	22·60	21·71	29·39	25·27	25·59	32·19
Fatty matter (ether extract)	3·16	5·09	5·40	5·27	4·31	5·29	3·75	3·91	5·38	5·30	4·98	3·77	5·33	4·96	5·07
Woody fibre	30·24	25·02	23·34	22·13	25·78	28·31	28·94	31·32	24·97	25·62	24·94	21·65	24·15	24·42	20·51
Other non-nitrogenous substances	51·66	47·06	43·88	37·35	45·73	38·07	36·31	37·02	39·33	33·76	36·51	33·43	33·02	32·24	29·62
Mineral matter (ash)	7·32	9·12	10·05	10·94	11·30	11·76	10·62	10·04	11·66	12·72	11·86	11·76	12·23	12·79	12·61
	100·00	100·00	100·00	100·00	100·00	100·00	100·00	100·00	100·00	100·00	100·00	100·00	100·00	100·00	100·00
Ten-acre Field.															
Nitrogenous substance (N×6·3)	8·81	12·95	15·94	19·75	11·94	18·73	19·42	15·49	18·98	17·46	19·87	—	25·53	24·82	—
Fatty matter (ether extract)	4·32	5·04	4·33	5·69	4·52	5·46	3·79	3·46	5·28	4·46	4·62	—	5·07	5·53	—
Woody fibre	32·59	29·74	25·83	23·54	25·95	26·72	27·50	30·08	26·12	26·76	28·07	—	22·83	23·59	—
Other non-nitrogenous substances	46·87	43·81	43·97	39·92	44·91	37·17	37·66	40·54	37·53	39·68	35·49	—	34·25	33·38	—
Mineral matter (ash)	7·41	8·46	9·93	11·10	12·68	11·92	11·63	10·43	12·09	11·64	11·95	—	12·32	12·68	—
	100·00	100·00	100·00	100·00	100·00	100·00	100·00	100·00	100·00	100·00	100·00	—	100·00	100·00	—

Table XXXVI.

Showing the Composition (per cent.) of the Unsewaged and the Sewaged Italian Rye-grass in the *Fresh State*, as weighed.

Season 1863.

—	First Crop.	Second Crop.			Third Crop.			Fourth Crop.			Fifth Crop.			Sixth Crop.	
	Unsewaged.	Unsewaged.	Sewaged.		Unsewaged.	Sewaged.		Unsewaged.	Sewaged.		Unsewaged.	Sewaged.		Sewaged.	
	Plot 1.	Plot 1.	Plot 2.	Plot 3.	Plot 1.	Plot 2.	Plot 3.	Plot 1.	Plot 2.	Plot 3.	Plot 1.	Plot 2.	Plot 3.	Plot 2.	Plot 3.
Nitrogenous substance (N×6·3)	2·67	1·94	3·26	2·29	3·05	3·33	2·32	4·95	2·30	3·50	3·63	3·87	3·80	4·60	5·06
Fatty matter (ether extract)	0·77	0·73	0·72	0·37	1·10	0·99	0·59	1·18	0·77	0·73	0·87	0·81	0·75	0·83	1·19
Woody fibre	3·79	6·84	4·49	4·93	10·36	7·70	5·45	8·33	3·88	5·36	4·61	4·20	3·50	4·22	4·42
Other non-nitrogenous substances	12·05	12·28	8·49	8·39	19·28	12·77	8·61	14·97	5·48	7·17	7·87	5·62	7·45	6·33	6·02
Mineral matter (ash)	2·02	1·91	1·85	1·54	2·56	2·68	1·31	3·78	1·41	2·13	2·94	2·25	2·26	2·66	3·09
Total dry substance	21·30	23·70	18·81	17·52	36·35	27·47	18·28	33·21	13·84	18·89	19·92	16·75	17·76	18·64	20·38
Water	78·70	76·30	81·19	82·48	63·65	72·53	81·72	66·79	86·16	81·11	80·08	83·25	82·24	81·36	79·62
	100·00	100·00	100·00	100·00	100·00	100·00	100·00	100·00	100·00	100·00	100·00	100·00	100·00	100·00	100·00

Table XXXVII.

Showing the Composition (per cent.) of the *Dry Substance* of the Unsewaged and the Sewaged Italian Rye-grass.

Season 1863.

—	First Crop.	Second Crop.			Third Crop.			Fourth Crop.			Fifth Crop.			Sixth Crop.	
	Unsewaged.	Unsewaged.	Sewaged.		Unsewaged.	Sewaged.		Unsewaged.	Sewaged.		Unsewaged.	Sewaged.		Sewaged.	
	Plot 1.	Plot 1.	Plot 2.	Plot 3.	Plot 1.	Plot 2.	Plot 3.	Plot 1.	Plot 2.	Plot 3.	Plot 1.	Plot 2.	Plot 3.	Plot 2.	Plot 3.
Nitrogenous substance (N×6·3)	12·51	8·19	17·33	13·07	8·38	12·12	12·70	14·92	16·63	18·54	18·22	23·11	21·40	24·70	24·82
Fatty matter (ether extract)	3·61	3·07	3·81	2·14	3·03	3·61	3·21	3·54	5·54	3·86	4·39	4·84	4·23	4·44	5·82
Woody fibre	17·79	28·85	23·86	28·13	28·50	28·03	29·83	25·10	28·02	28·36	23·15	25·05	19·72	22·61	21·71
Other non-nitrogenous substances	56·59	51·82	45·15	47·87	53·05	46·50	47·09	45·07	39·58	37·96	39·51	33·37	41·94	33·98	32·50
Mineral matter (ash)	9·50	8·07	9·85	8·79	7·04	9·74	7·17	11·37	10·23	11·28	14·73	13·43	12·71	14·27	15·15
	100·00	100·00	100·00	100·00	100·00	100·00	100·00	100·00	100·00	100·00	100·00	100·00	100·00	100·00	100·00

Table XXXVIII.

Average Composition (per cent.) of the Meadow Grass from each Plot, and of each successive Crop.
Second Season, 1862.

—	Mean Composition, per Cent.															
	Of the Fresh Grass as weighed.								Of the Dry Substance of the Grass.							
	Without, or with different Quantities of Sewage.				In each successive Crop.				Without, or with different Quantities of Sewage.				In each successive Crop.			
	Unsewaged.	Sewaged.			1st Crop.	2d Crop.	3d Crop.	4th Crop.	Unsewaged.	Sewaged.			1st Crop.	2d Crop.	3d Crop.	4th Crop.
	Plot 1.	Plot 2.	Plot 3.	Plot 4.					Plot 1.	Plot 2.	Plot 3.	Plot 4.				
Five-acre Field.																
Number of analyses	2	3	3	3	4	4	3	—	2	3	3	3	4	4	3	—
Nitrogenous substance ($N \times 6{\cdot}3$)	1·97	2·57	2·23	2·06	2·01	2·28	3·37	—	7·91	16·36	15·55	16·65	16·65	18·11	22·16	—
Fatty matter (ether extract)	0·63	0·65	0·52	0·60	0·58	0·64	0·65	—	2·67	3·67	3·55	3·73	2·70	3·62	4·29	—
Woody fibre	7·49	5·48	4·34	4·75	6·30	5·44	4·03	—	31·12	29·49	29·72	29·07	31·89	29·81	26·76	—
Other non-nitrogenous substances	12·06	7·44	5·88	6·62	9·16	8·00	5·10	—	48·92	36·42	40·02	40·31	45·79	43·10	33·84	—
Mineral matter (ash)	2·33	1·99	1·60	1·63	1·78	1·86	1·96	—	9·38	11·06	11·16	10·24	8·97	10·36	12·95	—
Total dry substance	24·71	18·43	14·57	16·29	19·78	18·22	15·11	—								
Water	75·29	81·57	85·43	83·71	80·22	81·78	84·89	—								
	100·00	100·00	100·00	100·00	100·00	100·00	100·00	—	100·00	100·00	100·00	100·00	100·00	100·00	100·00	—
Ten-acre Field.																
Number of analyses	2	3	3	4	4	4	3	1	2	3	3	4	4	4	3	1
Nitrogenous substance ($N \times 6{\cdot}3$)	2·42	2·45	2·41	3·38	2·49	2·10	2·79	6·16	11·08	14·94	15·85	16·97	14·93	12·06	18·73	18·22
Fatty matter (ether extract)	0·69	0·64	0·58	0·80	0·55	0·65	0·65	1·49	3·19	3·95	3·72	3·95	3·14	3·77	4·38	4·42
Woody fibre	6·47	4·90	4·47	5·74	6·02	4·80	3·98	8·40	28·47	28·92	28·65	30·45	33·59	28·09	26·63	24·86
Other non-nitrogenous substances	10·51	7·10	6·49	7·68	7·67	7·91	5·70	13·08	46·77	41·98	40·99	38·03	40·04	45·30	38·16	38·70
Mineral matter (ash)	2·29	1·66	1·68	2·27	1·53	1·88	1·80	4·67	10·49	10·21	10·79	10·60	8·30	10·78	12·10	13·80
Total dry substance	22·38	16·73	15·63	19·87	18·26	17·44	14·92	33·80								
Water	77·62	83·27	84·37	80·13	81·74	82·56	85·08	66·20								
	100·00	100·00	100·00	100·00	100·00	100·00	100·00	100·00	100·00	100·00	100·00	100·00	100·00	100·00	100·00	100·00

Table XXXIX.

Average Composition (per cent.) of the Meadow Grass from each Plot, and of each successive Crop.
Third Season, 1863.

—	Mean Composition, per Cent.																	
	Of the Fresh Grass as weighed.									Of the Dry Substance of the Grass.								
	Without, or with different Quantities of Sewage.				In each successive Crop.					Without, or with different Quantities of Sewage.				In each successive Crop.				
	Unsewaged.	Sewaged.			1st Crop.	2d Crop.	3d Crop.	4th Crop.	5th Crop.	Unsewaged.	Sewaged.			1st Crop.	2d Crop.	3d Crop.	4th Crop.	5th Crop.
	Plot 1.	Plot 2.	Plot 3.	Plot 4.						Plot 1.	Plot 2.	Plot 3.	Plot 4.					
Five-acre Field.																		
Number of analyses	2	4	4	5	4	4	3	3	1	2	4	4	5	4	4	3	3	1
Nitrogenous substance (N×6·3)	3·60	3·49	2·96	3·80	3·17	3·42	3·19	3·69	4·91	10·25	19·58	21·40	24·30	15·74	16·89	20·99	26·75	32·19
Fatty matter (ether extract)	1·31	0·90	0·70	0·76	1·01	0·93	0·80	0·63	0·77	3·73	4·88	4·94	4·84	4·73	4·31	5·22	4·68	5·07
Woody fibre	9·89	4·61	3·59	3·94	6·00	6·00	3·86	3·19	3·13	28·01	24·99	25·51	24·66	25·18	28·59	25·18	23·41	20·51
Other non-nitrogenous substances	17·20	7·34	5·28	5·51	10·64	8·79	5·69	4·52	4·52	48·70	39·47	36·74	34·55	44·99	39·28	36·53	32·90	29·62
Mineral matter (ash)	3·26	2·01	1·58	1·83	2·04	2·36	1·85	1·67	1·92	9·31	11·08	11·41	11·65	9·36	10·93	12·08	12·26	12·61
Total dry substance	35·26	18·35	14·11	15·84	22·86	21·41	15·39	13·70	15·25									
Water	64·74	81·65	85·89	84·16	77·14	78·59	84·61	86·30	84·75									
	100·00	100·00	100·00	100·00	100·00	100·00	100·00	100·00	100·00	100·00	100·00	100·00	100·00	100·00	100·00	100·00	100·00	100·00
Ten-acre Field.																		
Number of analyses	2	3	4	4	4	4	3	2	—	2	3	4	4	4	4	3	2	—
Nitrogenous substance (N 6×3)	2·83	2·69	3·10	3·05	2·99	2·89	2·64	3·46	—	10·38	16·89	19·59	19·98	14·36	16·39	18·77	25·17	—
Fatty matter (ether extract)	1·27	0·85	0·71	0·73	1·09	0·76	0·67	0·73	—	4·42	5·26	4·41	4·83	4·84	4·31	4·79	5·30	—
Woody fibre	8·84	4·49	4·18	4·14	6·77	4·89	3·80	3·19	—	29·27	27·53	25·73	26·32	27·93	27·56	26·98	23·21	—
Other non-nitrogenous substances	13·41	6·45	6·37	5·84	10·35	7·12	5·28	4·65	—	45·89	39·50	38·89	37·33	43·64	40·07	37·57	33·82	—
Mineral matter (ash)	2·63	1·73	1·82	1·78	2·03	2·07	1·67	1·72	—	10·04	10·82	11·38	11·54	9·23	11·67	11·89	12·50	—
Total dry substance	28·98	16·21	16·18	15·54	23·23	17·73	14·06	13·75	—									
Water	71·02	83·79	83·82	84·46	76·77	82·27	85·94	86·25	—									
	100·00	100·00	100·00	100·00	100·00	100·00	100·00	100·00	—	100·00	100·00	100·00	100·00	100·00	100·00	100·00	100·00	—

Table XL.

Average Composition (per cent.) of the Italian Rye-grass from each Plot, and of each successive Crop.

Season 1863.

—	Mean Composition, per Cent.																	
	Of the Fresh Grass, as weighed.										Of the Dry Substance of the Grass.							
	Without, or with different Quantities of Sewage.			In each successive Crop.							Without, or with different Quantities of Sewage.			In each successive Crop.						
	Unsewaged.	Sewaged.		1st Crop.	2d Crop.	3d Crop.	4th Crop.	5th Crop.	6th Crop.		Unsewaged.	Sewaged.		1st Crop.	2d Crop.	3d Crop.	4th Crop.	5th Crop.	6th Crop.
	Plot 1.	Plot 2.	Plot 3.								Plot 1.	Plot 2.	Plot 3.						
Number of Analyses -	5	5	5	1	3	3	3	3	2		5	5	5	1	3	3	3	3	2
Nitrogenous substance (N×6·3) - -	3·25	3·47	3·39	2·67	2·49	2·90	3·58	3·77	4·83		12·44	13·78	13·11	12·51	12·86	11·07	16·70	20·91	24·76
Fatty matter (ether extract) - -	0·93	0·82	0·73	0·77	0·61	0·89	0·89	0·81	1·01		3·53	4·45	3·85	3·61	3·01	3·28	4·31	4·49	5·13
Woody fibre - -	6·79	4·90	4·73	3·79	5·42	7·84	5·86	4·10	4·32		24·68	25·51	25·55	17·79	26·95	28·79	27·16	22·64	22·16
Other non-nitrogenous substances - -	13·23	7·74	7·65	12·05	9·72	13·55	9·21	6·98	6·47		49·21	39·76	41·47	56·59	48·28	48·88	40·87	38·34	33·24
Mineral matter (ash) -	2·64	2·17	2·07	2·02	1·77	2·19	2·44	2·48	2·88		10·14	11·50	11·02	9·50	8·90	7·98	10·96	13·62	14·71
Total dry substance	26·90	19·10	18·57	21·30	20·01	27·37	21·98	18·14	19·51										
Water - - - -	73·10	80·90	81·43	78·70	79·99	72·63	78·02	81·86	80·49										
	100·00	100·00	100·00	100·00	100·00	100·00	100·00	100·00	100·00		100·00	100·00	100·00	100·00	100·00	100·00	100·00	100·00	100·00

TABLE XLI.

SHOWING the Composition (per cent.) of the Milk from Cows fed respectively on Unsewaged and Sewaged Meadow Grass, with Oilcake in addition.

Season 1862.

	Food—Grass and Oilcake.						
	Dates of Collection.						Means.
	May 10.	June 4.	July 2.	Aug. 6.	Sept. 4.	Oct. 1.	
From 3 Cows on Unsewaged Grass.							
Casein	3·571	3·209	3·511	3·379	3·682	3·725	3·513
Butter	4·085	3·991	3·561	4·132	3·356	3·880	3·834
Sugar of milk, &c.	3·969	4·949	4·657	4·331	4·423	4·684	4·502
Mineral matter	0·744	0·713	0·778	0·798	0·757	0·728	0·753
Total solid matter	12·369	12·862	12·507	12·640	12·218	13·017	12·602
Water	87·631	87·138	87·493	87·360	87·782	86·983	87·398
	100·000	100·000	100·000	100·000	100·000	100·000	100·000
From 12 Cows on Sewaged Grass.							
Casein	3·554	3·324	3·434	3·189	3·651	3·649	3·467
Butter	3·750	3·672	3·459	3·281	3·310	3·879	3·559
Sugar of milk, &c.	3·951	4·560	4·658	4·677	4·329	4·463	4·440
Mineral matter	0·761	0·712	0·769	0·763	0·839	0·785	0·771
Total solid matter	12·016	12·268	12·320	11·910	12·129	12·776	12·237
Water	87·984	87·732	87·680	88·090	87·871	87·224	87·763
	100·000	100·000	100·000	100·000	100·000	100·000	100·000

Table XLII.

Details of the Sampling, and of the Determinations of Dry Substance, and Mineral Matter (Ash), in the Grass grown in the Fourth Season, 1864, without Sewage.

Fields.	Plots.	How treated in 1861, 1862, and 1863.	Number of Samples taken.	Weights. In fresh state. Each Sample.	Weights. In fresh state. Total.	Weights. Air-dried. Total.	Weights. Air-dried. Taken.	Actual Weights. Air-dried.	Actual Weights. Equal in Fresh State.	Actual Weights. Dry Substance (at 212° Fahr.)	Actual Weights. Mineral Matter. (Ash.)	Per-centages. Dry in Fresh. Each Experᵗ.	Dry in Fresh. Mean.	Ash in Fresh. Each Experᵗ.	Ash in Fresh. Mean.	Ash in Dry. Each Experᵗ.	Ash in Dry. Mean.
First Crop.																	
				lbs.	*lbs.*	*lbs. ozs.*	*ozs.*	*ozs.*	*ozs.*	*ozs.*	*ozs.*						
Five-acre	1	Unsewaged	2	10	20	8 6	50	12·5	29·851	10·392	0·764	34·81	34·70	2·359	2·569	7·352	7·406
								12·5	29·851	10·323	0·770	34·58		2·579		7·459	
	2	Sewaged	4	5	20	7 5	50	12·5	34·188	10·330	0·790	30·22	30·19	2·311	2·325	7·648	7·703
								12·5	34·188	10·312	0·800	30·16		2·339		7·758	
	3	Sewaged	4	5	20	6 14	50	12·5	36·364	10·250	0·770	28·19	28·12	2·117	2·131	7·512	7·580
								12·5	36·364	10·199	0·780	28·05		2·145		7·648	
	4	Sewaged	4	5	20	5 0	50	12·5	50·000	10·155	0·900	20·31	20·33	1·800	1·810	8·862	8·904
								12·5	50·000	10·173	0·910	20·35		1·820		8·945	
Ten-acre	1	Unsewaged	2	10	20	8 1	50	12·5	31·008	10·348	0·714	33·37	33·36	2·303	2·274	6·900	6·815
								12·5	31·008	10·344	0·696	33·36		2·245		6·729	
	2	Sewaged	1 / 2	10 / 5	20	7 8	50	12·5	33·333	10·252	0·790	30·76	30·84	2·370	2·376	7·706	7·705
								12·5	33·333	10·306	0·794	30·92		2·382		7·704	
	3	Sewaged	4	5	20	5 12	50	12·5	43·478	10·312	0·834	23·72	23·63	1·918	1·907	8·088	8·072
								12·5	43·478	10·230	0·824	23·53		1·895		8·055	
	4	Sewaged	4	5	20	5 5	50	12·5	47·059	10·110	0·893	21·48	21·50	1·898	1·905	8·833	8·862
								12·5	47·059	10·124	0·900	21·51		1·912		8·890	
Second Crop.																	
Five-acre	4	Sewaged	1	20	20	13 7	50	12·5	18·605	10·337	0·803	55·56	55·53	4·316	4·292	7·768	7·730
								12·5	18·605	10·323	0·794	55·49		4·268		7·692	

N 2

Table XLIII.

Results of the Mechanical Analysis of the Rugby Soils.

Composition per Cent.

——	Plot 1.	Plot 2.	Plot 3.	Plot 4.	Mean.
Five-acre Field.					
Stones retained by 1 inch sieve -	5·59	6·95	7·49	6·01	6·51
Stones passing 1 inch, and retained by ½ inch sieve - -	9·48	7·33	7·43	6·18	7·60
Stones passing ½ inch, and retained by ¼ inch sieve - -	6·04	4·44	3·58	3·36	4·35
Total stones -	21·11	18·72	18·50	15·55	18·46
Mould passing ¼ inch sieve -	77·77	80·36	79·80	83·29	80·31
Roots, loss by evaporation, &c. -	1·12	0·92	1·70	1·16	1·23
Total fresh mould -	78·89	81·28	81·50	84·45	81·54
	100·00	100·00	100·00	100·00	100·00
Ten-acre Field.					
Stones retained by 1 inch sieve -	1·54	2·47	3·66	2·90	2·64
Stones passing 1 inch, and retained by ½ inch sieve - -	1·92	2·18	2·43	3·68	2·55
Stones passing ½ inch, and retained by ¼ inch sieve - -	3·04	1·72	1·98	3·43	2·54
Total stones -	6·50	6·37	8·07	10·01	7·73
Mould passing ¼ inch sieve -	92·65	91·25	90·36	89·13	90·85
Roots, loss by evaporation, &c. -	0·85	2·38	1·57	0·86	1·42
Total fresh mould -	93·50	93·63	91·93	89·99	92·27
	100·00	100·00	100·00	100·00	100·00

The mode of collecting the samples was as follows:—A strong iron frame, in the form of the four sides of a box without either top or bottom, 12 inches square by 9 inches deep, was driven into the ground as much more than 9 inches as to allow a very thin sod (only just thick enough to insure the removal of the whole of the green matter) to be taken off the top of it. The contents of the frame were then carefully dug out; and four such samples of 12 inches square by 9 inches deep were taken from each plot, and mixed together. The soil of each plot was thus represented by a sample, averaging, in the case of the Five-acre Field rather over, and in that of the Ten-acre Field somewhat under, 300 lbs.

Table XLIV.

Results of the Chemical Analysis of the Rugby Soils.

Per-centages of Water, Organic Matter, Nitrogen, and Nitrogen reckoned as Ammonia.

Plots.	Water per Cent.		Organic Matter per Cent.			Nitrogen* per Cent.							Nitrogen reckoned as Ammonia Mean, per Cent.		
						In Fresh Mould.					In Dry Mould.	In Total Fresh Soil (including Stones, &c.)			
	In Fresh Mould as analysed.	In Total Fresh Soil (including Stones, &c.)	In Fresh Mould.	In Dry Mould.	In Total Fresh Soil (including Stones, &c.)	Expt. 1.	Expt. 2.	Expt. 3.	Expt. 4.	Mean.	Mean.	Mean.	In Fresh Mould.	In Dry Mould.	In Total Fresh Soil (including Stones, &c.)
Five-acre Field.															
1	14·65	11·39	5·30	6·21	4·12	0·192	0·191	0·191	0·191	0·191	0·224	0·148	0·232	0·272	0·180
2	15·59	12·53	5·80	6·87	4·66	0·195	0·191	0·197	0·204	0·197	0·233	0·158	0·239	0·283	0·192
3	15·22	12·15	6·06	7·15	4·84	0·187	0·183	0·190	0·182	0·185	0·218	0·148	0·225	0·265	0·180
4	14·68	12·23	5·05	5·92	4·21	0·182	0·181	0·186	0·184	0·183	0·214	0·152	0·222	0·260	0·185
Mean -	15·04	12·08	5·55	6·54	4·46	0·189	0·187	0·191	0·190	0·189	0·222	0·152	0·230	0·270	0·184
Ten-acre Field.															
1	20·66	19·14	9·10	11·47	8·43	0·264	0·258	0·257	0·252	0·258	0·325	0·239	0·313	0·395	0·290
2	18·61	16·98	9·80	12·04	8·94	0·243	0·247	0·236	0·246	0·243	0·299	0·222	0·295	0·363	0·270
3	17·60	15·90	8·20	9·95	7·41	0·240	0·236	0·226	0·231	0·233	0·283	0·211	0·283	0·344	0·256
4	17·56	15·65	9·20	11·16	8·20	0·254	0·247	0·252	0·249	0·251	0·304	0·224	0·305	0·369	0·272
Mean -	18·61	16·92	9·08	11·16	8·25	0·250	0·247	0·243	0·245	0·246	0·303	0·224	0·299	0·368	0·272

* The Nitrogen was determined by combustion with soda lime, and estimation as ammonia in the usual volumetric way. The results do not, therefore, represent the total nitrogen inclusive of that in the form of nitric acid, if any, excepting so far as it might be reduced by the organic matter present. Further, as the note at the foot of Table XLIII. will show, the figures only relate to the composition of the layer of 9 inches in thickness taken immediately below a very thin sod.

APPENDIX No. 2.

Notes on the Edinburgh Sewage Meadows.

The following statements relating to the sewage-irrigated meadows in the neighbourhood of Edinburgh are based partly upon information obtained on the spot from Mr. Mc Pherson the city surveyor, and from the occupiers or managers of the meadows in the respective localities, and partly upon correspondence with the latter gentlemen. Mr. Mc Pherson kindly provided information as to the population, water supply, springs, and area of rainfall and drainage, contributing to each set of meadows as named or classed together in Table I. below ; and from the occupiers or managers, information as to the area under irrigation, and other points, was obtained. As, however, the sewage is in no case passed over the land the whole 365 days and nights of the year, it must be borne in mind that the statements given as to the amount of population contributing to, and the number of tons available for, each acre, do not show the amounts actually utilized in each case, but only approximately the total amounts available, whether used or wasted. The fact that water-closets are not universal must also be taken into account.

Table I.

Names of Meadows.	Imperial Acres under Irrigation.	Approximate Population contributing to each Acre.	Approximate Quantity of Sewage available for each Acre.
			Tons.
Lochend, Spring Gardens, and Craigentinny	285	337	20,500
Roseburn and Western Dairy	80	112	17,000
Quarry Holes	8	562	65,000
Broughton Burn	6	1,666	102,000
The Grange	16½	302	97,000

1. *Lochend and Spring Gardens.*

The Lochend and Spring Gardens meadows, occupied by Mr. Scott, and under the management of Mr. Peter Taylor, comprise about 35 imperial acres, and are irrigated by the sewage of a large portion of Edinburgh on its way to the more extensive Craigentinny meadows. Mr. Taylor estimates that, on the average, each acre gets the flow of a stream of 12 by 8 inches, at a rate of 2 miles per hour, for 10 days of 16 hours, annually, which is equal to about 31,000 tons per acre per annum. The sewage is applied from about the beginning of March to the end of November. The herbage consists chiefly of rough meadow-grass (*Poa trivialis*), which is the most prevalent where the ground is dry, and couch (*Triticum repens*), which is the second in predominance, and grows freely, but is not so early as the rough meadow-grass. There is also a great deal of crow-foot, more particularly where the drainage is imperfect.

On a portion of higher lying land, which is irrigated by the aid of a water-wheel, worked by the sewage stream itself, and where the supply is necessarily more limited, Italian rye-grass is grown, which involves the periodical breaking up of the land. After two years under the rye-grass a crop of potatoes is taken, then Italian rye-grass is sown again, and so on. Mr. Taylor stated that if this land could be irrigated by an

abundance of sewage by gravitation he should prefer to lay it down as permanent meadow.

2. *Craigentinny.*

The meadows at Craigentinny, which are the property of Mr. Christie-Miller, are under the management of Mr. Bryce. About 190 acres of permanent meadow are irrigated by gravitation. A portion of this area consists of a good loamy soil, but a part of it was only barren sand before it was laid down for sewage irrigation. During the summer the sewage is applied day and night, and all that is available is then used, excepting during floods. The sewage is also applied through a considerable portion of the winter, but then during the day only. Perhaps it is unused 70 to 80 days in the year. The general plan during the summer is to let the whole of the water go over from 2 to $2\frac{1}{2}$ acres at a time, changing every 3 or 4 hours during the day, but less frequently during the night ; and the application is so timed as to get over, on the average, about 60 acres per week, and to give each acre such a dressing about once in three weeks. The applications are, however, less frequent during the winter. The distribution over about 100 acres can be attended to by one man ; but the cleaning of the runs, keeping the roads, &c., require additional labour. Four to five crops are obtained annually ; though four, cut at the proper times, generally yield better, and leave the herbage in better condition than when five are taken. From good, well managed meadows, with sewage as liberally applied as on the gravitation meadows at Craigentinny, Mr. Bryce thinks about 60 tons of green grass should be obtained per imperial acre annually. The price varies, according to season and other circumstances, from 6*d.* to 14*d.* per cwt., on the ground, standing. The produce consists almost entirely of rough meadow-grass, which is considered the most valuable, couch, which is looked upon as a very good grass and of very rapid growth, and common rye-grass, which is also considered a good grass, but not to give so close a bottom as the others.

Arrangements are also made for irrigating some higher lying land, by raising the sewage about 20 feet, it being first brought into a large tank by means of a deep underground drain from the highest level of the natural flow, and thence pumped into open channels for surface distribution. Only about 60 imperial acres are now so irrigated, but formerly a larger area was under the treatment. The application is continued from April to October inclusive ; and each plot gets six dressings, and yields three cuttings, annually. If it were not for the cost of lifting, more of this land would be laid down as permanent meadow, and much more sewage would be put upon it ; but the supply being so limited by the cost of application, Mr. Bryce thinks it better to sow Italian rye-grass, break up every two years and grow potatoes, re-sow rye-grass, and so on.

3. *Roseburn and Western Dalry.*

These meadows, situated to the west of the city, stand second in point of extent and importance to those of Craigentinny. They formerly comprised 100 imperial acres or more, but are now limited to about 80, having been considerably curtailed by the encroachments of railways, and for other purposes; and as much as 1,000*l.* per acre has frequently been paid as compensation. They were laid down for irrigation by Mr. James Thomson, who commenced his operations in 1826, and they still continue under his excellent management. Part of the soil is gravelly, and part loamy, with a subsoil of clay. The sewage

coming to these meadows includes the refuse from extensive slaughter-houses, and also that from a very large distillery. It is used all the year round, both day and night, and on Sundays when it can conveniently be left to flow from Saturday night to Monday morning. In summer the water seldom goes over the same piece of land more than a few hours together—as long as may be necessary thoroughly to soak it. The land is generally watered only twice, but occasionally three times, between the cuttings. In winter the water is allowed to flow for a longer period over a given area, in order to "feed" the land as much as possible. In laying down permanent meadow for irrigation, Mr. Thomson has sometimes sown a great variety of grasses, but finding that even when he has sown 15 or 20 different kinds, most of them have in the course of a few years gradually died out, leaving only those suitable to the soil and the sewage, he sometimes selects only three or four, and in one instance transplanted couch from arable land, and reports that the piece so treated is now as good as any.

4. *The Grange.*

Next in extent to the Roseburn and Dalry sewage meadows come those of the Grange, situated to the south of the city, and farmed by Mr. Mc Gill. The area of these meadows is at present only 16½ imperial acres; but it is less now than formerly, having been contracted for want, as was stated, of a sufficient supply of sewage. Indeed, the opinion given by Mr. Mc Gill, junior, was, that the greater the amount of water applied the better. The Table (p. 198) shows that the population within the area contributing to these meadows, and the amount of fluid available per acre, are, however, very large. On the other hand, the district is but imperfectly provided with water-closets, and the sewage is probably very dilute. The flow is frequently shifted only once a day, though sometimes three or four times, and in the spring, before the first cutting, generally as much as twice. The water is, as a rule, applied the day the grass is removed. The application is continued through the greater part of the winter, excepting where the last crop has been fed off. Perhaps the sewage is unused about six weeks in the year. The land is heavy, and rather steeply inclined. To a few plots on one side of the valley sewage is applied by gravitation, through a pipe carried across from a higher level of the natural flow on the opposite side.

The herbage contains no clover; and is, in fact, very soon brought down to a very simple character. It contains much couch, and also in some parts a good deal of crow-foot. When the plots are well managed four or five cuttings are obtained during the season. The crops of 1862 were sold at sums varying from 13*l.* to 38*l.* 5*s.* per imperial acre; the difference depending much upon the amount of sewage, the character of the land, the aspect, and the previous management of the cuttings, all of which affect the amount and character of the produce; but the convenience of position for cartage, proximity to other plots held by the purchaser, and other incidental circumstances, also sometimes affect the rates given for individual plots considerably.

Mr. McGill was of opinion that very much depended upon the quantity and strength of the sewage applied, and stated that portions of the land which had been irrigated by comparatively strong sewage were much more productive than others irrigated by almost pure water.

5. *Rose Bank, Broughton Road.*

These meadows, under the management of Mr. William Reid, comprise a little more than six imperial acres, and have been under irrigation

about 30 years. They are watered about 11 months in the year, at a cost of two shillings per week, given to a labourer who does the work of application at his meal-times and in over-time. The runs are, however, cleaned out in the winter by extra labour, paid for by the sale of the refuse, which commands about 2*s.* 6*d.* per ton. As the Table shows, the quantity of sewage available is enormous, being about 100,000 tons per acre per annum. Mr. Reid considered that quantity of water was a very important point, but that his supply was sufficient for considerably more land. He had not any more, however, at a convenient level, and did not consider that it would pay to be at any expense in raising the sewage. The irrigation is continued throughout the greater part of the winter as well as in the summer, and on Sundays as well as on other days. The water is applied to the same plot for three or four consecutive days, and the land gets, on the average, two such dressings for each cutting. It is considered better not to apply the sewage immediately after cutting, but to wait a few days until the grass has begun to shoot. The water does not run off the land clear. Four or five cuttings are obtained annually. The plots are from one-quarter to half an acre each, and they let at rates which amount to from 25*l.* to 30*l.* per imperial acre.

Mr. Reid's supply of sewage being so abundant, and having garden ground lying conveniently for its application, he occasionally applies it to about two acres; but he stated that he would go to very little expense in arrangements for the application of such small quantities as could be so used. The garden crops for which the sewage was found to be the most useful are turnips, cabbages, and onions.

6. *Quarry Holes.*

The Quarry Holes meadows, farmed by Mr. Thomas Skirving, comprise only about eight imperial acres, and the amount of sewage available per acre is very large, being about 65,000 tons per annum. The whole is in permanent meadow. The sewage is applied day and night, and on Sundays, the whole year round, excepting during very hard frost. A plot of an acre, more or less, receives the supply for about two days at a time, and gets three such dressings between the cuttings; but the water is not put on until two or three days after cutting, nor is it considered desirable to apply it when the grass is far advanced. As the Table shows, the amount of population contributing to each acre is greater in the case of these meadows than in that of any other in the neighbourhood of Edinburgh, excepting those of Rose Bank, and the amount of water is also very large. There is no doubt that there is very extravagant expenditure of manurial constituents here, as there is indeed in all the other cases; but it must, at the same time, be admitted that it is under these conditions that a greater amount of produce is obtained per acre under the influence of sewage than anywhere else, and perhaps among all the Edinburgh sewage meadows those of the Quarry Holes stand second to none in point of evenness of herbage, and amount and value of produce per acre. The prevailing grasses are rough meadow-grass and common couch.

APPENDIX No. 3.

Notes on the Sewage-irrigated Meadows at Beddington near Croydon.

The following particulars were obtained on the spot, partly from Mr. Latham the engineer to the Croydon Local Board of Health, and partly from Mr. Marriage, junior, son of the gentleman who rents and farms the irrigated meadows.

The population of Croydon contributing to the sewage tanks is about 16,000; and the water contributed to them is estimated at about 40 gallons per head per day without rainfall, and to average, the year round, perhaps 60 gallons per head per day with rainfall. These amounts are equal to about 65 tons per head per annum without, and 98 tons with rainfall. About 300 acres are rented by the Board at 4*l.* per acre without sewage, and sub-let to Mr. Marriage at 5*l.* per acre with sewage. Up to Midsummer 1864, 260 acres had been prepared for irrigation, of which about 250 might be considered as actually under irrigation during the year. It was intended to have 90 to 100 acres constantly under Italian rye-grass, but as yet not so large an area was under that crop.

The plan of irrigation is to let the sewage flow over from 20 to 30 acres for about four days and nights, and to give three such dressings between each cutting. As much of the water as can be recovered for the purpose is re-distributed, and in this way a large proportion is always used at least twice, sometimes three, and even four times over, and on the average about two and a half times, by which its utilisation and purification are rendered much more complete than otherwise would be the case. According to the figures given above there are about 6,250 tons of the dilute sewage with rainfall annually available for each of the 250 acres; but as so much of the water is re-used the average amount passing over each acre is very much more. There are also annually available for each acre the excretal matters of about 64 individuals of the mixed population of both sexes and all ages.

The land under sewaged Italian rye-grass is estimated to yield at least four cuttings, and from 30 to 35 tons of green produce per acre per annum. The cuttings commence in April, and last to the end of October, and even into November. This grass sells for about 25*s.* per ton in London, and is estimated to realise from 16 to 17 shillings per ton on the land. The sewaged meadow-grass also yields at least four cuttings annually, but it is much less liked than the Italian rye-grass by the London feeders, and is generally sold on the land by the rod, or grazed, and is estimated to yield several pounds less gross money return per acre per annum than the rye-grass.

Mr. Marriage does not apply the sewage in any systematic way to any other crops than permanent meadow and Italian rye-grass, but was about to try it on a small scale to mangolds.

There was a proposition under consideration by the Board to enlarge the area by 100 to 150 acres, which, notwithstanding the rapid increase of the population and of the sewage of the district, will, if carried out, considerably reduce the number of population contributing, and the amount of sewage available, to each acre annually.

About 180 tons of moist solid matter are annually deposited, or intercepted by the strainers, at the tanks, and are sold by the Board at a very low price per ton.

Before the above arrangements for passing the sewage of Croydon over the land were made, the Board were constantly subjected to legal

proceedings on account of the pollution of the river Wandle by the discharge of the sewage into it; but now those having the right of the fishing in the river have found it worth while to put down gratings to prevent the fish ascending the drainage outfall from the sewage-irrigated land.

In the following Table are collected together the results of some partial analyses of Croydon sewage, drainage, &c., which have been kindly communicated by Mr. Latham. The first four analyses are given on the authority of Messrs. Way, Evans, and R. D. Thomson, and the remainder on that of Messrs. Way and Evans alone.

TABLE I.—Results of the Analysis of the Water of the River Wandle, and of the Sewage of Croydon before and after Irrigation.

	Grains per Gallon.			
	Inorganic Matter.	Organic Matter.	Total Solid Matter.	Ammonia.
Samples collected October 1861.				
River Wandle above sewage outfall	18·56	1·44	20·00	0·18
Do. do. below sewage outfall	20·16	2·08	22·24	0·18
Sewage from an independent sewer	48·30	52·20	100·50	6·70
Drainage after sewage irrigation	23·40	2·40	25·80	0·21
Samples collected November 16, 1861.				
Sewage before reaching the tank, 11 a.m.	26·30	12·80	39·10	..
Drainage after sewage irrigation, 12.30 p.m.	21·25	6·50	27·75	..
Do. do. do. do. 2.30 p.m.	26·30	2·40	28·70	..
Do. do. do. do. 4.30 p.m.	25·50	3·45	28·95	..
Samples collected November 18, 1861 (after a sharp frost).				
Drainage after sewage irrigation, 2 p.m.	20·65	2·65	23·30	..
Do. do. do. do. 4 p.m.	20·95	2·90	23·85	..

The above analyses do not show what proportion of the several constituents existed in suspension and solution respectively; and, of the two samples of sewage, that collected November 16 contained, even before reaching the land, comparatively little solid matter of any kind. So far, however, as can be judged from these few, and little more than initiative results, it would appear that the water was to a considerably greater degree purified by its passage over and through the land than was the case in the Rugby experiments, in which the arrangements did not admit of the fluid being used two or three times over as with the more extended area at Croydon. The subject of the composition of the drainage-water passing from land liberally sewaged, but under arrangements for the re-distribution of the water until it is as far as practicable both utilised and purified, is, however, one of great importance, still requiring careful investigation.

APPENDIX No. 4.

Sewage of Towns.

The best mode of dealing with the sewage of towns has excited much interest.

The question as to the best mode for the disposal of town sewage has been met, in some recent instances, with a demand to abolish main outlet sewers and return to "a judicious use of cesspools."

Those who advocate a return to cesspools cannot have made themselves thoroughly acquainted with the evils involved by a retention of refuse near and within dwelling houses until putrid fermentation sets in and the most deadly forms of disease prevail. Modern sewerage and drainage works have, by the discharge of sewage, unquestionably fouled rivers, and there is a strong desire expressed on behalf of proprietors and populations resident on the banks of rivers, to prevent such fouling by forbidding any discharge of town or house sewage into rivers.

In the metropolis works of extraordinary magnitude in "High Level," "Mid Level," "Low Level intercepting," and "River Embankment Sewers," are now in course of construction, the estimated cost of which works exceeds 4 millions sterling. The whole volume of sewage, on both sides of the Thames, being discharged into the river at the points of outlet. These works, gigantic and costly as they are, only imperfectly intercept sewage from the river within the boundaries of the metropolis to discharge the concentrated volume into the tidal area a few miles near the estuary.

Proposals to utilize the sewage and to remove it from the Thames outlets are before the Metropolitan Board.

Town sewering and the disposal of town sewage involve sanitary questions of vital importance to the entire community—questions which have not been fully discussed, because they do not seem to have been fairly comprehended as forming the basis of sanitary science.

Irrigation of land by water is probably as old as civilization. The waters of the Nile irrigated the lands of Egypt from time immemorial, and irrigate them to this day. There are vast ruins in Ceylon and in central India of "bunds," reservoirs, tanks, and conduits which were used for the irrigation of adjoining lands. In China, rivers, lakes, and canals are made to aid artificial irrigation, and were so used when Great Britain was inhabited by painted savages; and there are remnants of canals and water conduits in Mexico and Peru, formed by a race of men who are chiefly known by vast ruins of temples buried in almost impenetrable forests.

Throughout the whole of the East water has been economized and used for purposes of agriculture from times beyond the records of written history.

There are modern works of irrigation on a great scale in British India and in parts of Spain, as also in Northern Italy. Italian irrigation is fully described in a "Report on the Agricultural Canals of Piedmont and Lombardy." Two volumes (1852).

The information contained in these volumes is so much to the point, in some respects, as showing how vast volumes of water are regularly and continuously disposed of for purposes of land irrigation, that I have made a short abstract. The entire volume of London sewage is only a small fraction compared to the bulk of water used in Piedmont and Lombardy.

(In the Preliminary Sewage Commission Report, Appendix No. 1., an account is given of a visit of inspection made by members of the Commission to Milan.)

In Piedmont some one and a half millions of acres are under irrigation; the volume of water at command is stated to be 8,290 cubic feet per second, conveyed through 1,200 lineal miles of canals, and distributed by numerous minor carriers and irrigating channels. The volume of water passed on to the irrigated lands varies from 5,000 up to 12,000 tons per acre per annum.

In Lombardy vast areas of land are under irrigation. In round numbers some 9,350 square miles, or about six millions of acres. The volume of lake, river, and spring water at command is estimated at 30,730 cubic feet per second, or about 100 times the estimated volume of sewage to flow from the entire metropolitan area. Within the water-shed of the Thames there are about three and a half million acres, and the dry weather flow of the Thames may be stated as about 1,000 cubic feet per second, so that it appears a volume of water equal to thirty times the dry weather flow of the Thames is used for purposes of irrigation in Lombardy.

The irrigated soil of Piedmont and Lombardy consists, for the most part, of deep beds of gravel overlaid by light sands through which water finds its way with facility. In the plains there are marsh and heavy lands requiring to be drained; vast areas are grazed by horses, cattle, pigs, and other stock, the manure made serving to enrich the soil.

The climate of Piedmont and Lombardy is favourable to a large use of water. In May, June, July, and August the mean temperature throughout the irrigated region ranges from 70° to 75° Fahr., and the maximum from 85° to 90°. At Milan, the temperature is, at times, 94°, at Brescia 93°, at Lodi 91°, and at Mantua 98°; the hygrometer showing an extraordinary degree of dryness in the atmosphere during the season of irrigation. With such subsoil, gravel and sand, such temperatures, 70° to 98° Fahr., and with such dryness of atmosphere, water for the land is of the utmost importance. During winter the entire district is, however, in a state of extreme humidity, approaching closely to saturation.

The fall of rain in the irrigated region is about 38 inches annually. The fall of rain is, however, confined to few days as compared with England. In Piedmont there are about 24 rainy days, and in Lombardy about 71 rainy days during the year. On an average, in northern Italy, there are about 200 clear days of sunshine, 125 cloudy days, and only 40 days on which rain falls. For little less than half the year the sky at Milan is unclouded, at Lodi more than half the year, and at Brescia for two thirds of the entire year the sun's light and heat are unchecked by cloud, so that we can comprehend how subsoil and climate allow 30 millions of tons of water per day to be passed over irrigated portions of lands with advantage. The pecuniary results obtained vary from £5 per acre, in the country, up to £10, and even £20 per acre per annum in the suburbs of Milan and other towns.*

Nature has done much for northern Italy in having provided mountain, rivulet, lake, river, and plain. Lombardy is bounded on the north by mountains (the Alps) capped with coverings of snow; there is a vast drainage area situate from 1,000 to 3,000 feet, and rising in mountain peaks 15,000 feet above the sea. This area is studded with lakes, of which Lago Maggiore is one of the chief; this single lake having

* Some of the works of irrigation do not pay interest upon the money expended even with all the natural advantages of subsoil and climate.

a superficial area of water of 47,280 acres, and an outlet elevation of 638 feet above the sea. Springs, rivulets, and streams feed the lakes which act as huge natural storage reservoirs, out of which rivers and rivulets flow down into and through the vast sunny plains below. Artificial waterworks in Great Britain sink into insignificance when compared with the arrangements provided by nature above the plains of Lombardy; even the huge "bunds" and reservoirs, tanks and conduits of Ceylon and of India are small in magnitude compared with the lakes of northern Italy. Nature lifts the water in vapour and in cloud, to store it so as to be available for human uses. For irrigation in Piedmont and Lombardy there is no artificial steam and engine power requisite. The fuel is in the sun, the lifting apparatus is in the clouds, vast natural lakes are store reservoirs, whilst rivers and smaller streams are conduits or "carriers."

The modern sewering of towns and draining of houses in England has led to the fouling of streams and rivers; but, and this must be fully considered, the value of human life has been increased in proportion as cesspools and cesspits have been abolished, and refuse has been removed in water.

The beneficial effects of sewers, drains, and waterclosets, in improving health, are recorded regularly in the Registrar General's returns. Notable instances have been mentioned as having taken place at Salisbury, at Worthing, and at other places. Dr. Letheby regularly records a rate of mortality for the city of London which no other capital in the world can parallel. The mortality of the metropolis is lower than that of Liverpool, Manchester, Birmingham, Leeds, Sheffield, or any other great town in the United Kingdom. In London, privies, cesspools, and cesspits have been systematically abolished, tubular drains and waterclosets have been substituted.* In the other large towns named the local civic authorities have not, as yet, learned so much of sanitary science. They believe in cesspits, or they dread sewerage rates; there are, however, worse forms of taxation than sewerage rates. The Registrar General in his report on the mortality of cholera in England, 1848–49, wrote, "Cholera ravaged the popula-
"tion through summer, after harvest destroyed more than a thousand
"lives a day for several days in succession, and in the year had slain
"53,293 men, women, and children. Pestilence found in so many cities,
"towns, and districts, poisonous putrid matters ready to destroy this
"number of inhabitants."

Plague, cholera, and typhus appear to have one common propagating nidus—fermenting filth, foul air, and squalor. There must be soil, seed, rain, and sunshine to produce herbage and grain; there must be the elements necessary to grow zymotic diseases before they can prevail.

The common privy and cesspit are great nuisances, especially in towns. The cesspit is most frequently placed in small yards behind houses, at times beneath living rooms and bed-rooms, crowded in amongst thickly built cottages, so as to foul the subsoil below and the air above; very frequently the festering wet soil filters through cottage walls or floods the cottage floor, causing discomfort, disease, and death. Parish surgeons and medical men who visit the poor have borne witness, on numerous occasions, to the evils of town cesspits. Local

* Old sewers in the Metropolis have not been constructed on any well defined principles. There are about 1,300 miles of main sewers, besides 82 miles of outlet sewers, and upwards of 300,000 houses drained. Many of these old sewers are in ruins, have flat inverts, and retain foul deposit. The main sewers are also defectively ventilated.

registrars record the heaviest death-rates in such districts, and the relieving officer spends most of the parish money among the wretched inhabitants.

In many large towns cesspits, though private nuisances, are public property; the municipal governments claim the right to empty them. The word "cleanse" is used in the municipal records; cesspits are emptied, but they are never cleansed. In this process of emptying there is a vast amount of human suffering. Not unfrequently the foul refuse must be carried, or wheeled, through houses, on all occasions it must be removed into streets, and those only who have experienced the sickening smell can fully understand the misery endured by the unfortunate inhabitants given up to the operations of nightmen. This operation is not only foul and mischievous, but unremunerative to the extent of 50 per cent. of the entire outlay. That is, if it costs £20,000 per annum to empty the middens and cesspits in Manchester, the sale of manure and ashes will not produce more than half this amount. The pecuniary loss to the inhabitants in damaged health cannot so readily be estimated.

As compared with privy and cesspit the watercloset is a vast improvement, and if drain, sewer, and water supply are complete, no fouling of urban atmosphere or of subsoil can take place. From a well-drained house, and completely sewered town, all refuse is removed at a rate of at least one mile per hour. "Dry closets," of every form, are necessarily social abominations in a town.

Some few attempts have been made to apply liquid sewage direct to land for agricultural uses; but no actual and unmistakable results have, as yet, been realized on any great scale. Edinburgh and Croydon are both exceptional in some respects. Large volumes of sewage, at both these places, flow directly on to and over land peculiarly fitted by nature to produce results, in many respects, favourable. In neither case is there (to any serious extent) steam-engine power required for pumping, nor is there any expensive distributing plant, or distributing piping. The sewage is flooded on to the land without cost, without stint, without fettering conditions, and it produces heavy crops of grass, and below Edinburgh some of the land has been continuously irrigated for more than 200 years without diminution of the annual crop. Land is the proper place for liquid sewage, and in every instance where liquid sewage, in its discharge from sewers, is liable to become a nuisance the local authorities ought to be compelled to filter their sewage through land, even if at a pecuniary loss in the process. Towns can afford to pay the necessary costs of works capable of preventing both nuisance and disease. Liverpool and Manchester each pay some eight or ten thousands of pounds annually to remove foul cesspit matter, which has worked incalculable mischief. It cannot, therefore, be considered any extravagance if the capital represented by such sum should be expended in utterly abolishing cesspits, by a regular and continuous removal of cesspit matter in a fluid state on to and over land, so as not to be cause of nuisance.

That town sewage has value as a manure has been proved by every chemist of name. Liebig, Lawes, Way, Gilbert, Hoffman, and others give it a money value of from 2*d.* to ½*d.* per ton of fluid. Professor Way, however, affords a key to one form of difficulty, namely, the cost of application may be, in some cases, more than the value of the manure.

Up to this time sewage has been dealt with by several processes. At Birmingham there is merely skimming and separating of solids by

precipitation in tanks; the sewage water, slightly clarified, flowing into the river Tame from the tanks. The dry weather volume of sewage at Birmingham is about 12 million gallons per day, the amount of sediment removed from the subsiding tanks is about 25,000 tons per annum. This sediment is, for the most part, road grit, worn and washed from road and street, mixed with true sewage matter. The tanks are regularly emptied, but the material is, or was, unsaleable even at so low a price as sixpence per ton. The refuse comes out in the form of sludge and cannot be readily dried so as to be made portable. The cost to the corporation is some thousands per annum. The river is still tainted, and the adjoining land is injured rather than benefited.

Liquid sewage is spread over land at Croydon by gravitation; at Carlisle, Rugby, Watford, and at Worthing by pumping. In some other places the sewage solids are intercepted, as at Leamington, Cheltenham, Leicester, Tottenham, Worksop, and Morpeth; but in the greatest number of places the entire sewage is wasted into the nearest river or watercourse, as at Berwick-upon-Tweed, Alnwick, Lancaster, Liverpool, Manchester, and at most of the Lancashire towns, as also at all the towns throughout Cumberland, Northumberland, Durham, and Yorkshire. Indeed one sweeping remark may include 99 hundreds of all the cities, towns, villages, and districts in Great Britain,—with slight exceptions, there is a general waste of sewage, where sewers exist.

The question of sewage utilization has been thrown back by errors in works; too much has been expected and too much has been attempted. Experience, so far as carried, proves that fluid sewage cannot be manipulated into a solid manure so as to pay. There have been attempts at Leicester, at Tottenham, and for a time at Croydon. During the continuance and working of these sewage works there was the greatest possible amount of nuisance with no paying result. At Leicester the solid which was expected to sell for four pounds per ton could not be sold for four shillings a ton. At Birmingham the sewage sludge accumulates beyond the power to sell it at sixpence a ton. At Leamington there is an annual cost, at the outlet works, of some 400*l.* to precipitate and remove the sludge from about one million gallons of sewage per day. At Cheltenham, Coventry, Worksop, and at some other places the deposited sludge is sold at prices ranging from one shilling to two shillings per ton; in all these cases the fluid—the true sewage—is wasted.

To utilize fluid sewage land is required, and a regular agricultural establishment must be set up. Town Councils and Local Boards of Health have not, as yet, considered it a part of their duty to obtain land by lease or by purchase—with the exception of Croydon—and here an "Injunction" was necessary to compel local action.

The Croydon case settles the question, so far as it goes, namely, that irrigation by gravity, through surface carriers and open grips, over loamy ground, and producing grasses, will purify sewage water without causing nuisance, and will also produce a moderate income. But, if the Croydon sewage had required to be lifted 350 feet vertical (the lift contemplated for vast volumes of metropolitan sewage), and if cast iron and earthenware conduit pipes (as proposed for distributing metropolitan sewage) had been laid down the balance would have been against the Local Board of Croydon.

The only safe mode of advancing the project of sewage application will be to commence works in the simplest and cheapest forms; namely, surface irrigation by gravity. This can be done on both sides of the Thames to a limited extent; the experiment, if found to pay, can then

from time to time, be extended. To lease the sewage of London to a company, proposing to raise and expend capital by many millions sterling, will be ruin to confiding shareholders and a cruel punishment to many innocent persons. The Leicester Sewage Company was supported by men of reputation, who risked their money and lost it; but many innocent persons were lured in by seeing well known names on the list of shareholders; so it has been and so it will be again if the Metropolitan Board of Works is driven, by outside opinion, to act contrary to common sense and experience.

The great irrigation works in Piedmont and Lombardy may be studied with advantage; lakes and rivers are turned to account on a grand scale, vast volumes of water are conducted along open canals, and such waters are distributed by open conduits and carriers; the entire volume of water is disposed of by means of surface irrigation. The works are cheap, as compared with the cost of cast-iron mains, and hose and jet, for distribution. It may be said "Italian irri-" gation is by pure water, and London sewage could not be safely " exposed in open channels." The reply is, that open canals will in every respect be cheaper; and, practically, may be prevented from being a nuisance. Covered conduits may be adopted near towns and near houses; but, as by far the greatest length of canal and carrier must be in the country, covering such canals and carriers, in such positions, would be an extravagant waste of capital. Brick tanks, in which to store sewage, soon become vast abominations; canal-like tanks, with earth sides, should, in all cases, be used, as the earth acts as a disinfectant; and in such canals greater length and area can be obtained for the outlay.

If the rivers of England are to be purified, it must be by intercepting canals to receive all fluid refuse and convey it to land for purposes of irrigation. The river Thames requires intercepting canals through its entire length. Such work need not be planned beyond the rateable means of the populations resident on its banks, and who now contribute to the pollution of its waters. This form of improvement may also be carried out on every polluted river in the kingdom with advantage. Any income derived from irrigation will be in reduction of first cost, establishment, and working charges.

The inquiries and experiments made up to this time tend to the following conclusions; namely,

That the pollution of rivers and streams ought to be prevented.

That sewage is beneficial to agriculture, when applied to land.

That the available value of sewage will depend upon local contingencies, which can only be estimated when all the elements are known. The chemists' test and value form only one item in the problem.

When sewage is applied to land, as at Edinburgh and at Croydon, it does not appear to injuriously affect health in the locality.

Sewage irrigation works should be as simple and as economical as is possible. Gravitation and surface irrigation, as at Edinburgh and at Croydon, should be made available wherever practicable. If steam pumping power is necessary, open canal-like tanks, open carriers, and surface irrigation should be adopted. No lift should be attempted greater than is necessary to allow the sewage to flow by simple gravity.

Sewage irrigation may be carried on over the same ground for an indefinite period, as is proved by some of the land near Edinburgh, which has been regularly irrigated upwards of two centuries.

No known or tried form of precipitating sewage, so as to obtain a portable solid manure, has ever been made to pay in Great Britain.

The utilization, so as to purify town sewage, ought to be imperative, as at Croydon.

Sewage is continuously produced and should be as continuously utilized. This will be accomplished most easily and cheaply by having at command a proper proportion of land to act as a filter. Sand, gravel, or combinations of sand, gravel, and loam form the best natural filters. Heavy clay lands should be avoided, excepting for moderate irrigation.

It will cost more in capital for plant, and in labour to manipulate 500 tons of sewage over ten acres by cast-iron pipes, hydrants, and hose and jet, than to utilize 5,000 tons on one acre by open carriers.

Sewage is not equally rich at all times of the twenty-four hours. In sewers which regularly discharge fresh sewage, as at Carlisle and at all towns sewered on true principles, night sewage and day sewage differ materially. At Carlisle analyses have shown that from 10 o'clock p.m. to 8 o'clock a.m. discharge from the outlet sewer is almost entirely subsoil water. There is, as might be expected, an increase in volume and strength in the morning about 9 o'clock ; at noon, and again from 6 to 8 o'clock p.m. In Carlisle, in Wigan, and in Swansea, with 35,000 inhabitants each, and with some 6,000 houses drained, there is no expenditure below the surface in the sewers to remove solids. The daily flow of water is sufficient to preserve the sewers clean.

The sewering of towns on correct principles ought to be promoted, so as to ensure cleanliness, comfort, and health.

Parliamentary authority is needed to give enabling powers to deal with sewage, as generated in the several river drainage areas.

The only safe mode of disposing of town sewage is to filter it through land. The agricultural value will be dependent on local contingencies. Where conditions are favourable and works are cheap and economically managed the application of sewage for agricultural uses will pay. Where conditions are not favourable, a small rate in aid may be required, as at present is the case in many towns, to enable local authorities to dispose of cesspool and cesspit matters.

River areas should be dealt with as a whole, and not, as at present, in detail.

ROBERT RAWLINSON, C.E.

Note.—The map of the river Thames Drainage Basin serves to show how complicated the question of pollution has become. There are 56 towns within the basin of the Thames above the Chelsea and other West-end Metropolitan Waterworks pumping stations at Hampton. These towns consist of not less than 147,000 houses, and comprised a population at the census of 1861 of 710,000. This population is increasing. Many of these towns at present sewer into the Thames, or into its tributary streams, as at Windsor, Henley, Reading, and at Oxford. New and more perfect sewerage works are contemplated for Reading, for Oxford, and for other of the towns in the Thames Basin, so that the waters of the river will become more and more polluted, unless some adequate provision is made to compel filtration of all town and house sewage through, at the least, four feet in depth of agricultural land.

The map also shows the northern and southern outfalls into the Thames, and the site of the Foulness and Maplin sands, which sands are proposed to be reclaimed and irrigated by the Metropolitan sewage from the northern side of the Thames.

MAP OF
THE THAMES DRAINAGE BASIN.

Showing the Rivers, the Principal Towns above the present source of the Metropolitan Water Supply at Hampton, and the position of the Maplin Sands at the entrance of the River; to which point it is proposed to carry the Sewage of the Metropolis.

Approximate Area of Basin above Hampton	*3656 Square Miles.*
..... *or*	*2,339,840 Acres.*
Do ..... Do ..... below ..... Do	*1,800 Square Miles.*
..... *or*	*1,152,000 Acres.*
Number of Houses	*147,000*
Population	*710,000*

THAMES HEAD 376 feet above the level of the Sea

SITE TO WHICH IT IS PROPOSED BY MESSRS NAPIER AND HOPE, TO CONVEY THE NORTHERN SEWAGE OF THE METROPOLIS.

N.B. In the Basin above Hampton there are 56 Towns
" " " " below " exclusive
of the Metropolis, there are ..... 32 "
Towns under the Local Government Act
shown thus ..... WINDSOR

Scale of Miles.

10 5 0 10 20 30 40 50

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APPENDIX No. 5.

On the Contamination of the Water of Leith by the Sewage of Edinburgh and Leith.

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Plan of Edinburgh, Leith, and Suburbs, illustrative of the Main Drainage Scheme for the purification of the Water of Leith.

Map of the Water of Leith from its source to its discharge into the Sea at Leith.

On the Contamination of the Water of Leith by the Sewage of Edinburgh and Leith. By Stevenson Macadam, Ph. D., F.R.S.E., F.C.S., Lecturer on Chemistry, Surgeons' Hall, Edinburgh.

I. *Introduction.*

The drainage of the city of Edinburgh is at present carried away by three main channels, and the boundaries of these are determined by the uneven nature of the ground on which Edinburgh stands, which necessitates that there shall be three distinct watersheds. The entire population of Edinburgh is about 168,121 persons, who inhabit 34,828 separate occupations, and the rental of the city in 1863–4 was 933,536*l.* sterling. The three drainage districts convey the sewage to separate waters or burns, and whilst a large proportion of the sewage is carried to the Water of Leith, much is taken away to the sea by the Craigentinny Burn and the Powburn or Jordanburn. The larger proportion of the drainage passes into the Water of Leith, and is thence carried down to Bonnington and Leith, receiving accessions of sewage as it passes on, and when it arrives at the harbour of Leith, the water is still further contaminated by the discharges from the sewers of Leith.

The Water of Leith drainage system, within the parliamentary boundary of the city of Edinburgh, comprehends an area of 2,196 acres, on which there are 13,243 separate occupations, and the rental of which in 1863–4 was 456,108*l.*, whilst the population numbers about 69,000. Of the 13,243 dwellings there are 4,460 houses and shops which have no water-closets, but active measures are being taken by the municipal authorities to enforce the introduction of water-closets into those houses which are still devoid of such conveniences; and when these are carried out, the amount of sewage will probably be increased about one fourth. The majority of the houses which drain into the Water of Leith have cesspools in their immediate neighbourhood, and these tend to arrest much of the more solid parts of the sewage, but these cesspools are gradually being abolished, although it will take some time to remove the whole, as about 12,000 out of the 13,243 houses in this district are still connected with cesspools into which all the sewage from the houses passes and thereafter the liquid, with more or less solid matter, flows off into the drain and sewer. When these cesspools, which are a relic of a bygone system, are entirely done away with, the quantity of solid matter conveyed in the sewage of Edinburgh will necessarily increase. The population of Leith is about 35,000, of whom 22,000 reside south of the harbour, in that part of Leith known as South Leith, whilst the remainder occupy houses to the north of the harbour, in the district of North Leith.

During last session parliamentary powers were acquired for the construction of a main drainage pipe which would intercept the sewage of the large district of Edinburgh and Leith, which is now allowed to pass into the Water of Leith, and convey that sewage direct to the sea. The designs for this scheme of main drainage were made by Messrs.

Stevenson, M'Pherson, and Paterson, and the engineering details given in this paper are taken from the reports and evidence of Messrs. D. and T. Stevenson, under whom the works are being carried out. The drainage of North Leith is not proposed to be connected with the main drainage pipe, but is to be carried out independently by the Corporation of Leith, and the liquid is to be discharged into the sea by a special conduit. The drainage of South Leith, however, is to be intercepted by the main drainage pipe, and, along with the sewage of the Edinburgh district the whole is to be carried out to sea and discharged at the Black Rocks.

The cost of the main drainage works will be defrayed by an assessment for one year not exceeding 2*s.* 6*d.* per pound on the rental of those houses and premises which are within the drainage district and the parliamentary boundaries, and which contribute to the sewage ; and as the rental of the Water of Leith district in Edinburgh is 456,108*l.*, and of South Leith 80,600*l.*, the total rental to be taxed is 536,708*l.* An assessment of 2*s.* 6*d.* in the pound on this sum will yield 67,088*l.* 10*s.*, and deducting five per cent. for the cost of collection, there is left a net sum of 63,734*l.* 1*s.* 6*d.*, to which there has to be added a sum of 4,000*l.* which the Leith Docks Commission have agreed to give in support of the scheme, making in all the sum of nearly 68,000*l.* as the available funds for carrying out this important sanitary measure.

The Water of Leith, which is at present contaminated with the sewage matter to be diverted into the main drainage pipe, is comparatively a small stream, and whilst during the winter months and after rain there is a current of water passing down its bed, yet in summer and dry weather the whole of the natural water of the stream is diverted into mill-lades which traverse the whole course of Edinburgh, and there is little or no natural water in the bed of the river as it passes Edinburgh. Into this small stream of water there is discharged the sewage of 70,000 of the inhabitants of Edinburgh, and upwards of 30,000 of the people of Leith, and the result has been that the bed of the Water of Leith has become a foul polluted stream, conveying fæcal matter of the most disgusting and abominable character, and evolving fœtid emanations into the surrounding atmosphere. In many parts of its course through Edinburgh the bed of the Water of Leith is rocky and uneven, and in the pools thus formed much of the solid matter conveyed by the sewage stagnates, and, passing into a state of putrescence, evolves abundantly offensive gases. Larger accumulations of fæcal matter are arrested by the mill-dams, and, indeed, the numberless pools in the bed of the Water of Leith, and the various dams, form numerous cesspools open to the air, which are practically hot-beds of decomposing filth.

The Water of Leith, before it reaches Edinburgh, is essentially a mountain stream, the waters of which are originally of a mossy or peaty nature, and the faint brown tinge of colour which it exhibits at its sources, is much deepened as it passes several paper mills and other public works which discharge liquid matters into the stream. The run of water is always kept up from large compensating reservoirs, which retain much water during the wet seasons, and discharge it at a regular rate during the periods of drought. These compensating reservoirs owe their construction to the withdrawal of the spring water which previously flowed into the Water of Leith and which has been diverted into Edinburgh by the Water Company for the supply of the city, as well as of the towns of Leith and Portobello. The mill-

owners on the Water of Leith compelled the water company to provide storage-room sufficient to hold eight months' supply of the spring water abstracted, but in reality the compensation reservoirs hold more than the quantity rendered imperative by the various Acts. In 1849 the amount of spring water abstracted by the water company was from 150 to 200 cubic feet per minute, and in 1859 other 200 cubic feet per minute were taken, making altogether about 400 cubic feet per minute of spring water abstracted from the Water of Leith in its upper parts, and which, being transmitted through pipes to Edinburgh for service there, is returned back again, in good part, to the Water of Leith by the drains and sewers.

The compensation reservoirs constructed in lieu of the spring water, and which send down a regulated supply of water into the bed of the Water of Leith, are of large size. There are two reservoirs about eight miles distant from Edinburgh, at the base of the Pentland Hills, viz., those of Harelaw and Thriepmuir, which cost about 36,000*l*., and a third reservoir, about 13 miles from Edinburgh, also at the base of the Pentland Hills which is called Harperrig reservoir, which cost about 25,000*l*. The latter reservoir is bound to store 85,000,000 cubic feet of water above the level of six feet from the top of the offlet-pipe, but it actually stores 90,000,000 cubic feet above that level. The total capacity of these compensation reservoirs is sufficient to store 150,000,000 cubic feet of water, and in dry weather they discharge into the Water of Leith, according to the state of the weather and the demands of the mills, from 1,000,000 to 1,500,000 cubic feet of water per day, which is at the rate of 700 to 1,050 cubic feet per minute. As only about 50 cubic feet per minute are allowed to escape from Saturday evening till Monday morning, there is a saving of the water to the extent of about one sixth of the available power.

The water supply of Edinburgh is necessarily connected directly with the sewage of the city. In 1681 certain springs were brought in by the town council from the lands of Comiston, and in 1762 a 4½-inch wooden pipe was employed for the conveyance of water from certain springs rising in the estate of Swanston on the northern side of the Pentlands. The supply of water from these sources, however, was very uncertain in quantity, and varied from 12 cubic feet to 60 cubic feet per minute. In 1822 a further supply of water was obtained from Glencorse, and the Crawley spring on the southern slope of the Pentland Hills, and the increase was sufficient to give an average flow of water of about 250 cubic feet per minute. In 1848, by the abstraction of a number of springs on the northern slope of the Pentlands, and which originally flowed into the Water of Leith, the average supply of town water was increased to 460 cubic feet per minute ; and in 1859 further springs on the northern side of the Pentland Hills were acquired, and the supply was increased to upwards of 700 cubic feet per minute. During the course of the last 20 years, therefore, schemes have been carried out whereby about 400 cubic feet of spring water per minute have been abstracted from the streamlets which feed the water of Leith, making altogether the large amount of 210,000,000 cubic feet per annum, and in lieu thereof compensating reservoirs have been constructed which can store 150,000,000 cubic feet, or more than eight months' supply of the springs. Besides the regular delivery from these reservoirs of sufficient water for the motive power of the mills, there is an additional supply of clear spring water conveyed in special pipes to the paper mills, glue works, and washing establishments to the extent of a constant run of 42 cubic feet per minute, and this extra amount of water, when used in the operations of paper making, &c.,

is also discharged into the Water of Leith. Considering the great expense connected with bringing in the spring water, and the cost of the compensation reservoirs, &c., which, altogether, entailed an expenditure on the part of the Water Company of 500,000*l.*, it is calculated that the 750 cubic feet of water per minute at present delivered each day in Edinburgh, Leith, and Portobello has cost the Water Company at the rate of 666*l.* for each cubic foot of spring water rendered available for town use during each minute.

The special investigations relating to the contamination of the Water of Leith by the sewage of Edinburgh were commenced on the 14th March 1864, and were continued almost daily for five weeks, and they were resumed on the 20th May, and were carried on for other 10 days. The principal sewers and drains were examined in all conditions of weather, and at all hours of the day and night, and similar observations were made on the Water of Leith, above Edinburgh, during its transit through the city, and onwards till it passed out of the harbour of Leith to seawards.

The examination not only included the liquids with mechanically suspended organic matters, as collected from the sewers and the Water of Leith, but likewise took cognizance of the sedimentary matters which lodged in the drains and the bed of the streams down to and including the harbour of Leith ; as also the gases evolved from these decomposing sedimentary matters ; the gases dissolved in the various liquids ; and the state of the atmosphere immediately above the districts where the drains and the Water of Leith were conveying sewage. The numerous chemical analyses proved the foul condition of the matters carried by the sewers into the Water of Leith ; and the offensive state of the stream itself, and indeed the senses of sight and smell were sufficient to show that the sewage had converted the Water of Leith into a great public nuisance, which it was desirable to get rid of. Many of the inhabitants of the district immediately bordering on the stream complained bitterly of the offensive odours which rose from the water, and which gave rise to nausea and sickness, and compelled them to keep their doors and windows shut. Moreover, Professor Simpson showed from the statistics of the mortality in the streets bordering on the river, as compared with those away from its banks, that there was a greater death-rate in the immediate neighbourhood of the Water of Leith than at a short distance therefrom. Thus, taking a similar class of houses in the Edinburgh district, and judging by the mortality amongst children under five years of age, Professor Simpson found that in the streets away from the influence of the foul water the mortality was in the proportion of 100, whilst in the streets near the Water of Leith the mortality was as high as 160. In the Leith district also the death-rate was greater, as in the streets at some distance from the harbour the mortality was in the proportion of 100, with a death-rate among children under five years of age of 1 in 12 ; whilst in the same class of streets near the river and harbour the mortality was at the rate of 141, and the death-rate among children one in seven. These statistics are positive evidence of the effects of the foul, filthy, and offensive state of the Water of Leith conveying the sewage of Edinburgh and Leith, and the results are supported by the concurrent testimony of many persons who reside in the immediate neighbourhood of the Water of Leith, and who speak as to the nausea and sickness which are brought on by the inhalation of the gases and vapours evolved from the water, and to the general ill-health connected therewith.

II. *The liquid Discharges from the Sewers of Edinburgh and Leith.*

The sewage drainage area of Edinburgh and Leith which discharges into the Water of Leith is about 611 acres, of which Edinburgh contributes 514 acres and Leith 97 acres. This area does not include the gardens and open spaces, but merely that which is built upon and contributes to the quantity of sewage. The maximum discharge of sewage from this area is 574 cubic feet per minute, and whilst there are no less than 180 large and small sewers which empty their contents into the Water of Leith,—the majority of these are small,—and there are only six main sewers which convey the fæcal matters from Edinburgh, and two principal sewers which receive and discharge the sewage of South Leith into the river and harbour of Leith. The average amount of day discharge of sewage per acre of ground built upon ranges from $\frac{8}{10}$ths to $\frac{9}{10}$ths of a cubic foot per minute, but the proportion varies much from day to day and from hour to hour. The greatest daily discharge occurs on Mondays and Tuesdays, as on those days the majority of family washings takes place, and on these occasions the full amount of 574 cubic feet per minute is attained. On Wednesdays and Thursdays the proportion of sewage is less, and on Fridays and Saturdays it is still further diminished, and indeed, on those days it does not average more than four-fifths of the discharge of Monday and Tuesday. The quantity of sewage is greatest at 11 o'clock in the forenoon, after which it diminishes till about five o'clock in the morning, it falls to about one-half, after which it increases gradually till 11 o'clock forenoon, when the maximum is again attained. The sewage water is in the most filthy state in the forenoon, and during the evening it is comparatively clear of fæcal matter.

The main sewers which convey the fæcal matter from Edinburgh into the Water of Leith are the Lochrin Burn, which discharges itself into the stream at Coltbridge, a short distance west of Edinburgh; the South or Moray Place sewer, which flows into the bed of the Water of Leith at Stockbridge; the North sewer, which also discharges at Stockbridge; the Canonmills sewer, which joins the Water of Leith at Canonmills; the Broughton Burn, which empties its contents into the stream above Junction Road Bridge, Leith; and the Bulls Stank sewer, which flows into the harbour of Leith, immediately below the Junction Road Bridge at Leith (see Plan of Edinburgh and Leith). The two latter are mainly Edinburgh sewers, but as they traverse the outskirts of Leith before they join the Water of Leith, a small portion of the sewage of Leith is conveyed by them. The principal sewers which carry the fæcal matter from South Leith are the St. Andrew's Street drain, which enters the harbour as the Coal Hill sewer, and the Bernard Street drain, which empties its contents into the harbour by the Lower Drawbridge sewer. In the chemical examination of the contents of these sewers, portions of the discharges were collected at different periods of the day and night, and during the six days of the week, so as to ensure that the condition of the sewage at all times should be fairly represented. Moreover, during the earlier observations in the spring of the year, viz., during March and April, the weather was often boisterous and wet, whilst during the summer observations, viz., in May, the weather was comparatively fine and dry, so that the average of the various samples collected at the different periods will fairly represent the mean composition of the sewage discharges during the year. The influence which these sewage matters can have upon the Water of Leith will be best considered by referring to the main

sewers individually, and observing especially the nature of their discharges at different times.

The Lochrin Burn, which is one of the main sewers of Edinburgh, has its rise in the house drains south of the castle, and thereafter travels in a westerly direction, collecting the sewage of many streets of houses in the west end of the city, and the drainage of the Edinburgh Abattoir and of the Caledonian Distillery. The total drainage area which falls into this burn is about 860 acres, but the built-on area or space is only about 100 acres, and taking the mean proportion of nine-tenths of a cubic foot per minute for each acre as the average amount of house sewage, the calculated quantity of domestic drainage-water would be 90 cubic feet per minute, which is really the full amount of the observed quantity. Thus, by actual measurement, it was found that at about eleven o'clock in the morning the discharge from the Lochrin Burn was 98 cubic feet per minute, and at a quarter past nine in the same evening the discharge fell to 51 cubic feet per minute, whilst in the succeeding morning at half past five the quantity rose to 69 cubic feet per minute, and at 11 o'clock in the forenoon to 92 cubic feet per minute. The average of all the measurements gave about 60 cubic feet per minute. During the summer in dry weather there is little if anything but sewage in the Lochrin Burn. There is a small drain which joins the Burn at Dalry, and which runs at the rate of about 3 cubic feet per minute, but this is the only accession which is worthy of note. During its course through the built-on area the Lochrin Burn is a covered drain or sewer, but when it emerges into the country districts on the west side of Edinburgh it becomes an open ditch or burn, and before it reaches the Water of Leith it is partially employed in the irrigation of a number of fields. The irrigation processes are carried out at intervals during the winter months, and somewhat regularly during the summer months, and tend to lessen not only the actual quantity of liquid which flows in the burn, but also to decrease the proportions of dissolved and suspended matters contained therein.

The sewage conveyed by the Lochrin Burn was collected at three different stations, one of which was immediately after the burn received the drainage of the Edinburgh Abattoir, a second station was immediately above the entrance of the liquids discharged from the Caledonian Distillery, and the third place of collection was immediately before the burn entered the Water of Leith at Coltbridge. 18 samples of sewage were collected at the first station in Lochrin Burn, and the details of the chemical analyses are given in Table A. The average composition of the 18 samples showed, that the liquid contained in one imperial gallon in a state of solution 12·36 grains of organic matter with 26·61 grains of saline matter, and in suspension 33·06 grains of organic matter with 24·66 grains of earthy matter, in all 45·42 grains of organic matter, and 51·27 grains of saline and earthy matter, making a total of 96·69 grains of organic and saline and earthy matters dissolved and suspended in one imperial gallon. 15 samples of sewage were collected at the second station, which was before the Lochrin Burn reached the Caledonian Distillery, and the details of the examination of these are given in Table B. The average of those samples gave of dissolved and suspended organic matter 44·38 grains, and of saline and earthy matters 34·49 grains, making 78·87 grains in one imperial gallon. Immediately after passing the second station, the Lochrin Burn receives the discharges from the Caledonian Distillery, and these consist mainly of dreg obtained from the stills. The analyses of three samples of dreg are given in Table B., and

the average composition of two samples of this substance in one imperial gallon gives 611 grains of organic matter, and 118 grains of saline and earthy matters. The discharge of this dreg is very irregular, but it must tend to increase materially the proportion of matters dissolved and suspended in the sewage matter of the Lochrin Burn, and as it is of a putrescible nature, it adds to the foul condition of the water. The third station on the Lochrin Burn, or that immediately preceding the discharge of the burn into the Water of Leith, is the principal one in regard to the contamination of the stream, as the liquids are collected just before they pass into the Water of Leith. At this station 20 samples of liquid were collected on different days, and at different hours, and the details of the analyses are given in Table C. The average of the 20 samples yielded in one imperial gallon in a state of solution, $31\frac{1}{4}$ grains of organic matter and $26\frac{1}{2}$ grains of saline matter; and in a state of mechanical suspension, $29\frac{1}{4}$ grains of organic matter and 9 grains of earthy matter: making $60\frac{1}{2}$ grains of organic and $35\frac{1}{2}$ grains of saline and earthy matters, and altogether 96 grains of dissolved and suspended matters in the imperial gallon. In every instance the liquid from the Lochrin Burn was in a foul and offensive condition, and evolved a fœtid disgusting odour. This was specially observable on those occasions, when there was an appearance of blood in the water coming from the abattoir; and during the times that dreg was issuing from the Caledonian Distillery a sour nauseous odour predominated.

The Lochrin Burn is the first Edinburgh sewer which discharges itself into the Water of Leith, and though the direction of the burn is westerly in its flow, yet, when it discharges into the stream, it is carried in an easterly direction back through Edinburgh and Leith, before it passes to the sea on the east coast. After the reception of the Lochrin Burn, the Water of Leith receives the discharges of numerous small sewers and drains as it flows through the Water of Leith village, and when it reaches the district of Edinburgh, known as Stockbridge, two large main sewers discharge their contents into the stream. These sewers are the South or Moray Place sewer, which collects the house-drainage of a built-on area of about 20 acres, though the total drainage area is about 30 acres. The discharge of sewage has never been gauged above 18 cubic feet per minute. The North sewer at Stockbridge likewise receives a large amount of house sewage from a built-on area of 23 acres. 22 samples of the liquid discharges from these sewers were analysed (see Table D). The average of 10 samples from the North sewer gave in solution and suspension in one imperial gallon $21\frac{1}{2}$ grains of organic matter and 33 grains of saline and earthy matter, in all $54\frac{1}{2}$ grains; whilst the average of 12 samples from the South or Moray Place sewer gave $31\frac{3}{4}$ grains of organic matter and 35 grains of saline and earthy matter, in all $66\frac{3}{4}$ grains of dissolved and suspended matters in the imperial gallon.

From Stockbridge the Water of Leith flows down in the direction of Canonmills and receives on its way the contents of numerous small drains, and at Canonmills a large sewer discharges itself into the stream. This sewer, which is known as the Canonmills sewer, collects the sewage from a drainage area of 171 acres, of which 116 acres are built upon. The analyses of 21 samples of the liquid conveyed by this sewer are given in Table E., and the average proportions in one imperial gallon are $23\frac{3}{4}$ grains of organic matter and 35 grains of saline and earthy matter in solution and suspension, making in all $58\frac{3}{4}$ grains. After this accession of sewage matter, the Water of Leith passes down to the outskirts of Leith where the Broughton Burn sewer, which

carries much Edinburgh sewage accompanied by the drainage of an outlying district of Leith, joins the stream. The average of two samples of the Broughton Burn sewage (Table F.) gives 48 grains of organic matter and $42\frac{3}{4}$ grains of saline and earthy matter in one imperial gallon, in all $90\frac{3}{4}$ grains. Flowing still further seaward, the stream passes into the harbour of Leith, and at the upper end of which the Bulls Stank sewer, which mainly flows from Edinburgh, discharges its contents. One analysis of the contents of this sewer was made at Lovers Loan immediately after the sewer leaves Edinburgh proper, and other four samples were collected from the sewer as it discharged into the harbour of Leith. The liquid of this sewer contained an average of $16\frac{3}{4}$ grains of organic matter and $36\frac{3}{4}$ grains of saline and earthy matter, in all $53\frac{1}{2}$ grains in the imperial gallon (Table F). Thereafter the Coal Hill sewer, which is very foul, conveying fæcal matter from Leith, discharges its contents into the harbour. The mean analysis of three samples of the discharge from the Coal Hill sewer (Table F.), which is also called the St. Andrew's Street drain, showed the large proportion of 145 grains of dissolved and suspended organic matter, and 182 grains of saline and earthy matter, making in all 327 grains of matter in one imperial gallon. And amongst others, another large Leith sewer, known as the Bernard Street drain, pours its contents into the harbour at the side of the Lower Drawbridge, and the liquid discharged therefrom contains $18\frac{1}{4}$ grains of organic matter and $51\frac{1}{4}$ grains of saline and earthy matter, in all $69\frac{1}{2}$ grains in the imperial gallon.

Whilst the Coal Hill sewer and the Lower Drawbridge sewer are the principal sewers which convey the house drainage of South Leith into the harbour, there are many smaller drains which discharge their contents into the water not only on the South-east side, but also on the North-west side of the harbour.

The general appearance of the matters discharged by the Edinburgh and Leith sewers into the water of Leith was foul, fæcal, and offensive. The night discharge, or that occuring between 11 P.M. and 5 A.M., was comparatively free from gross pollution, but at all times the contents contained sufficient organic matter in solution and suspension to cause putrefaction when retained in a vessel for a short time. Even when the liquids were filtered through bibulous paper, at the moment of their collection, the filtered liquid, though comparatively clear, yet contained much organic matter in solution, possessed a fœtid odour, gave a foul taste, destroyed the colour of a large amount of permanganate of potash, and when kept for a short time passed into a state of putrefaction. The number of samples of sewage liquids collected from the drains and sewers of Edinburgh and Leith, and analysed by me amounted to 107, and these were taken during all states of the weather, and at all times of the day and night. In every instance the water was more or less contaminated with flocculent matter, principally of organic origin, and on being allowed to settle, the suspended matter fell to the bottom of the vessel.

III. *Sedimentary Matters in the Sewers of Edinburgh and Leith.*

The more solid part of the sewage conveyed by the drains, tends to deposit whenever the rapidity of the current is lessened, and whilst in the ordinary sewers there is no great accumulation of sedimentary matter, yet the Lochrin Burn, the Bulls Stank sewer, and the Broughton Burn are somewhat sluggish in their movements, and hence at many parts of their course much foul deposit is found. This was spe-

cially observable at the parts of the course of these drains where they run as open ditches. At the Lochrin Burn sewer, west of the abattoir, a large amount of sedimentary matter was found, and the average of seven samples (Table G.) gave when dried 49⅔ per cent. of organic matter, which contained a considerable amount of nitrogen, and when lying in the bottom of the sewer was in an active state of putrescence, and evolving abundantly offensive and noxious gases. A similar observation was made at Lochrin Burn sewer immediately before it arrived at the Caledonian Distillery, where the bed of the sewer was more or less covered by decomposing and putrefying matters, and the average of three samples of sediment collected at this point (Table G.) gave 27⅔ per cent. of organic matter containing nitrogenous and putrescent elements. At the Lochrin Burn sewer, immediately before it discharged into the Water of Leith above Coltbridge, much sediment was also found, and whilst it was likewise of an active putrescent nature, it was mingled with more fine earthy matter. The average of three samples (Table G.) gave 17 per cent. of organic matter containing nitrogen. Sedimentary matter was also collected in quantity from the Bulls Stank sewer at Lovers Loan immediately after leaving Edinburgh (Table G.), and contained 50¾ per cent. of organic matter of a nitrogenous nature. And similar organic sediments were found in the Broughton Burn at the Bonnington Road, and just before the burn enters the Water of Leith (Table G).

The solid matters which form these sediments in the various sewers where the run of water is slow, are in a state of active putrescent fermentation, and are not only hurtful whilst present in the sewers by giving off abundantly fœtid exhalations of noxious gases, but whenever a shower of rain falls and the amount of water and the rapidity of the flow increases, these sedimentary matters are swept onwards and are discharged with the ordinary liquid sewage into the bed of the Water of Leith. The results are that when the rain is limited in quantity, much sedimentary matter is thus thrown into the stream and lodges in the uneven bed, though when the weather is broken and much rain falls, the sedimentary matters are swept onward by the current and discharged into the sea. The quantity of such sedimentary matter which is lodged in the bed of the Water of Leith throughout its course will be presently referred to, and the nature of the gaseous emanations from those putrefying sediments will also be described in detail.

IV. *The Water of Leith.*

The offensive state of the water and harbour of Leith, due to the discharge of the sewage of 70,000 of the inhabitants of Edinburgh and 30,000 of the inhabitants of Leith, has necessarily called forth public attention on several occasions for the purpose of adopting some means for the arrestment of the evil. Accordingly, in 1854, operations were commenced for the purpose of aiding to some extent in the removal of the fulsome discharges by providing a more rapid run of water at certain parts. The original and natural bed of the Water of Leith is of a very uneven and rocky nature, and being of some width, the small amount of water which accompanies the sewage, except in floods, is only sufficient to diffuse it over the bed of the stream and convey it down in a sluggish manner, which admits of a great deal of the solid matter being deposited in the rocky pools and cavities and on the banks of the stream. The measures adopted in 1854 were restricted to a part of the Edinburgh district, and were confined to the improvement of the bed of the river for only a mile

and a quarter in length, from St. Bernard's Bridge to St. Mark's Place, with a break of about 200 yards at the ford at Malta Green. The pools in the stream were filled in and the shallow and deep places were levelled, whilst the channel was narrowed by making a run in the centre of the bed of the river, by filling in the banks with stones, and keeping the run clear by wooden planks being placed along each side. Open iron conduits were also laid at the sides of the narrowed channel so as to convey the sewage from the drains into the central run. It was also proposed that when the matters had been conveyed down to St. Mark's Place, that the foul water should be there subjected to some deodorising process. The latter part of the scheme was never attempted, but the narrowing of the channel was carried out.

Arrangements were also made for the flushing of the central run by diverting water from the mill-lades for a few hours, once a fortnight, and for the liberty of using the water in this way the sum of 30*l.* a year was arranged to be paid to the mill owners.

The scheme for the levelling of the bed of the stream and the confining of the run of water and sewage was no doubt effectual in arresting the deposition of large quantities of decomposing filth at certain parts of the stream, but it was only a partial benefit. No improvement was effected in the bed of the river above where the run was restricted, and in those upper parts, as behind Ainslie and Moray Places, the numberless pools in the rocky bed still admitted of the deposition of large quantities of putrescent sediment. Moreover, the narrowed channel was not free from sedimentary organic matter, and in most places the slightest agitation of the bottom gave rise to the evolution of numberless bubbles of gas. And again, whenever the water rose a little, overflowed the narrow channel, and then subsided, it left on the banks much organic sediment which filled up the spaces between the stones, and being alternately moistened and dried, and acted on by the sun's rays, emitted much offensive effluvia. Whilst the nuisance was not entirely abated in those parts of the stream where the channel was narrowed, the working out of the scheme led to the more ready conveyance of large quantities of offensive material to St. Mark's Place, below which there is a mill-dam or caul, and the water being there kept back, became extremely sluggish in its movements and deposited much of the suspended matters. The result was the accumulation at this part of a foul deposit of considerable depth, and in a state of active putrescent fermentation. This place was essentially an enormous cesspool, near the upper end of which there were stepping stones (now a bridge), and on numerous occasions especially in summer weather, when there was occasion to use the stepping stones, the foul fæcal condition of the Water of Leith was plainly observable, and the highly offensive exhalations which emanated therefrom in the warmer seasons of the year were such as to produce an intolerable stench.

The improvements in the condition of part of the bed of the Water of Leith which were commenced in 1854 did not therefore provide for the abstraction of sewage from the Water of Leith, or for the arrestment of the discharge of impurities thereinto, but it merely arranged for a partial alleviation of the evil in one district of Edinburgh. Whilst much of the stream above the narrowed part was left in its ordinary foul state, there was much left also below, and indeed from Edinburgh to Leith there was no abatement of the nuisance, and the harbour of Leith, as previously, continued to receive the sewage of 100,000 people. Matters were in this position when the corporations of Edinburgh and Leith instructed me, in conjunction with Professor Penny of Glasgow, to institute a full series of experimental observa-

tions on the nature of the sewage discharged into the Water of Leith, and the effect which that sewage had upon the stream itself and the harbour of Leith. The chemical nature of the sewage as discharged by the drains and sewers of Edinburgh and Leith has been already fully adverted to in this paper, and the details of the analyses made by me of these sewage matters are given in the tables. I have now to refer to the chemical composition of the Water of Leith as contaminated by the sewage ; and in order that the effect of such may be correctly observed, I will first refer to the nature and condition of the Water of Leith before it reaches Edinburgh, and thereafter to its state when it receives the various accessions of sewage.

V. *The Water of Leith above Coltbridge.*

The sources of the Water of Leith are mainly derived from the upland districts on the Pentland Hills, and the waters originally are of a peaty or mossy nature. The water is collected in large compensating ponds or reservoirs ; two of which are situated about eight miles west from Edinburgh, and the outlet from which is known as the Bavelaw Burn, and the remaining reservoir is about 13 miles west from Edinburgh, and its water flows into the head stream of the Water of Leith (see Map). The Bavelaw Burn joins the Water of Leith above the village of Currie, about six miles west from Edinburgh, and the two streams then flow on to Edinburgh as the Water of Leith. There is a flax ropery work and a paper mill on the Bavelaw Burn, and six paper mills, a washing establishment, and a glue work on the Water of Leith before it arrives at Coltbridge and mingles with the sewage of Edinburgh. The ropery and the paper mills discharge considerable quantities of dark-coloured alkaline solutions from the boilers in which the flax, rags, and esparto fibre have been boiled, and these discharges tend to increase the quantity of saline and organic matters dissolved in the water, as may be seen from Table H., where the analyses are given of eleven samples of water from the Water of Leith before it reaches the neighbourhood of Edinburgh, and also the analyses of 23 samples collected immediately above Coltbridge and just before the contamination of the stream with the sewage conveyed by the Lochrin Burn From the latter analyses it will be observed that the average of these 23 samples gives 5 grains of organic matter and $15\frac{1}{4}$ grains of saline matter in one imperial gallon, in all $20\frac{1}{4}$ grains. The discharges from the ropery company and the paper mills contain much alkali, soluble silica, and some organic matter dissolved therein, accompanied by the washings of the boiled rags, and the water from the washing and beating engines and paper machines. These fluids tend to communicate more or less of a yellow brown colour and slight alkalinity to the Water of Leith, but they do not leave any deposit on the stones in the bed of the stream or on the banks thereof. So far as the chemical observations were carried out, there was no appearance of a putrefactive tendency in the contents of the water as it arrived at Coltbridge as a running stream, and though the water was not to be commended for dietetic use and ought not to be employed for such, yet there were no offensive gases escaping therefrom, and therefore there was no evidence of the contamination of the neighbouring atmosphere by exhalations which might be regarded as unwholesome. There are several villages situated on or near the banks of the Water of Leith before it arrives at Coltbridge, but these villages have no regular system of house drainage, and hence the water is not materially contaminated with sewage in its upper parts, and certainly, when it

arrives at Coltbridge, it does not contain an appreciable trace of house sewage.

VI. *The Water of Leith from Coltbridge to the Harbour of Leith.*

Whenever the Water of Leith arrives at Coltbridge and the Lochrin Burn mingles its sewage therewith, then the water begins to assume an offensive appearance, acquires a fœtid odour and taste, and when kept for a short time becomes putrescent. After receiving the sewage, the proportions of organic and saline matters increase in quantity. Samples of the water at all the principal points in its course through Edinburgh and Leith and passing out into the harbour, were collected at different times and subjected to analysis (Tables I., K., L., M., and N.) This part of the stream divides itself into five distinct portions :—

I. From Coltbridge down to the dam below Water of Leith village, where much of the water is at all seasons diverted into the lade which traverses the whole length of Edinburgh, and where, in ordinary dry summer weather, the whole of the liquid flows into the lade.

II. From the dam below Water of Leith village, where the lade diverges from the main stream, down to St. Mark's Place.

II. The lade which commences at the Water of Leith village, and, after traversing Edinburgh, is again united with the Water of Leith at St. Mark's Place.

IV. The Water of Leith at St. Mark's Place after the stream and lade with their Edinburgh impurities have commingled, and,

V. From St. Mark's Place down to and including the harbour of Leith.

The first part of the district comprehended from Coltbridge down to the dam below the Water of Leith village contains the natural flow of the stream, accompanied by the sewage of Lochrin Burn and numerous smaller sewers and drains. In dry or summer weather the amount of liquid which flows down this part of the stream is about 1,600 cubic feet per minute, and there are three mill-dams or cauls which retard the motion of the water and allow of sedimentary matter being deposited. These mill-dams also cause the whole of the water in the stream in dry or summer weather to be diverted into the lades, and necessarily at these parts there is no fall of water in the bed of the stream during such periods. The liquid of the stream or lade, however, still retains much organic matter in solution and suspension. Eleven samples of liquid were collected from this district and subjected to analysis (Table I.) and the average of these samples gave, in one imperial gallon, $9\frac{3}{4}$ grains of organic matter and $16\frac{1}{4}$ grains of saline matter, in all 26 grains.

The second district begins at the dam below the Water of Leith village and terminates at St. Mark's Place, and it is peculiar in this respect, that whilst during ordinary dry summer weather there is no flow of water over the dam, there is, at other times, a small portion passing over, and it is only during flood time that a decided flow of water is seen below the dam. The comparatively dry bed of the Water of Leith, however, very soon receives accessions of water, partly by leakage from the sides of the lade which flows for some distance alongside of the stream at a higher level, and in other part from numerous small drains conveying house-sewage. Six samples of liquid were examined from the Water of Leith under the Dean Bridge, six samples from the stream behind Moray Place and near St. Bernard's Well,

and six samples from the Water of Leith above Stockbridge (Table K.), and the mean of the analyses of these samples gave about 10 grains of organic matter and $16\frac{1}{4}$ grains of saline matter in the imperial gallon, in all $26\frac{1}{4}$ grains. At Stockbridge, however, the water receives the contents of two large sewers (the South or Moray Place sewer and the North sewer), and nine samples collected about 30 yards below the point of discharge of these sewers at Stockbridge (Table K.) gave an average, in one imperial gallon, of 9 grains of organic matter and $15\frac{1}{2}$ grains of saline matter in solution, and $14\frac{1}{4}$ grains of organic matter and $2\frac{1}{2}$ grains of earthy matter in suspension, in all $23\frac{1}{4}$ grains of organic matter and 18 grains of saline and earthy matter dissolved and suspended in the Water of Leith at this point. Another station behind Warriston Crescent and below the entrance of the Canonmills sewer gave similar evidence of the contamination of the water (Table K.)

The Edinburgh lade district commences at the dam below the Water of Leith village; it is one of six lades which receive the Water of Leith between Coltbridge and the sea, and each of which has its appropriate mill-dam. These lades take in all the river-water as well as the Lochrin Burn during the ordinary dry weather in summer, and the amount of water in the lades is about 1,600 cubic feet per minute. The principal lade is the one which traverses Edinburgh and which begins at the Water of Leith village. Generally it runs as an open ditch, occasionally washing the sides of the houses, passing through below houses and under the streets, and ultimately arrives once again at the Water of Leith at St. Mark's Place. The lade and its contents were specially examined behind Ainslie and Moray Places, and behind India Place, where the wall of the houses is actually the side of the lade, and where spouts standing out from the houses discharge the contents of household sinks and closets directly into the lade. At Clarence Street, where the lade passes below the houses; at Eyre Place, where it flows in front of the houses, as well as at Beaver Hall, and immediately before the junction of the lade with the stream, and indeed at all parts of the course of the lade, the liquid was foul and faecal, and the average of eight samples collected at two different stations (Table L.) gave $10\frac{3}{4}$ grains of organic matter and $18\frac{1}{4}$ grains of saline and earthy matters, in all 29 grains, dissolved and suspended in one imperial gallon.

The district of St. Mark's Place is interesting as the spot, where the Water of Leith conveyed in the lade once again joins the stream, and at this point the effect of the greater part of the Edinburgh sewage upon the natural water of the river is best observed. The pool of water at St. Mark's Place is of considerable length and depth, and the flow of the water is retarded by a mill-dam at a little distance below. The liquid presents a most offensive appearance, and contains much organic matter in mechanical suspension as well as in solution. Much putrifying organic matter lies at the bottom of the pool, and indeed the district is an enormous cesspool. The decomposing sediment is constantly evolving numberless bubbles of noxious gases, the disengagement of which causes a constant commotion in this comparatively stagnant pool, and tends to keep much matter in a state of mechanical suspension in the water. The fulsome condition of the Water of Leith at this district, especially in a warm summer day, is highly disgusting and abominable. 18 samples of the liquid were collected from the Water of Leith at St. Mark's Place (Table M.), and the average of these samples gave in

one imperial gallon 8 grains of organic matter and $14\frac{3}{4}$ grains of saline matter in solution, and $18\frac{1}{2}$ grains of organic matter and $15\frac{1}{4}$ grains of earthy matter in suspension: in all $26\frac{1}{2}$ grains of organic matter and 30 grains of saline and earthy matter in solution and suspension. The foul appearance of the liquid at St. Mark's Place was increased during the warmer months by floating patches of organic matter bouyed up by the gases evolved during the putrefaction of the mass, and which not only served to keep such matter floating, but also were successful in raising from the bed of the pool a constant succession of new aggregations of decomposing matters.

The fifth district extends from St. Mark's Place down to the harbour of Leith, and 13 samples of water were collected at 10 different places (Table N.). One sample was from the dam above Bonnington, which is the lower end of the pool which extends up to St. Mark's Place; one sample was taken from the Water of Leith at the boundary of Edinburgh and Leith at Bonnington Bridge; another sample from the dam above Junction Road Bridge; one sample from the Water of Leith above the saw mills at Leith; two samples from the harbour of Leith below the Junction Road Bridge; three samples from the harbour above the Coal Hill; one sample from the harbour in front of the Coal Hill sewer; one sample from the harbour at the upper drawbridge; one sample from below the upper drawbridge; and one sample from the harbour off the Victoria Dock-head. Several of these samples were very foul from the large amount of suspended organic matter, and in all cases there was sufficient putrescible matter present to cause the liquid to exhibit a fœtid, nauseous odour, and a turbid and nasty appearance.

The special conclusions which are to be drawn from the observations on the water of the Water of Leith from Coltbridge down to the sea, and the relative analyses, are that whilst the water is comparatively free from impurity before being contaminated by the sewage, and is not liable to become putrescent, yet, the moment the sewage enters the stream the water is rendered foul, and as the drains increase in number and discharge their fæcal contents into the stream, the nuisance increases. At no time after the Lochrin Burn enters is the water free from the power of passing into a state of putrescence. Even when filtered on the spot at many different stations, the liquid which was obtained, though somewhat clear and transparent, yet contained more or less organic matter, had a foul taste and a fœtid odour, destroyed the colour of much permanganate of potash, and when allowed to stand for some days passed into putrefactive fermentation and evolved stinking gases.

VII. *The Sedimentary Matters in the Bed of the Water of Leith.*

The solid matters which the sewers of Edinburgh and Leith carry in mechanical suspension into the Water of Leith are deposited in large quantities in ordinary seasons in the pools or cavities in the rocky bed of the stream, and also at the bottom of the still water which is found above all the six mill dams or cauls.

Immediately below the entrance of the Lochrin Burn into the Water of Leith at Coltbridge a bank of deposit of decomposing solid sewage matter, several feet in depth, lies putrefying and exhaling foul gases, and from this point to the mill-dam at a short distance below, the fermenting sediment is more or less deep, and indeed from this station down to the harbour of Leith, the bed of the Water of Leith,

including the part where the channel is narrowed, and also the bottom of the lade, are covered more or less thickly with putrefying sediment (Table O.). This was specially observable—

1. At the dam below Water of Leith village, where the foul deposit consisted on the average of four samples, of 48 per cent. of organic matter, containing nitrogen, and was in a state of active putrescence (Table O).
2. In the numerous pools in the rocky bed of the Water of Leith behind Moray and Ainslie Places, where the putrefying stuff is often two feet in depth, and contains on the mean of two samples 45 per cent. of organic matter with nitrogen (Table O.)
3. In the bed of the Water of Leith, below the North and South sewers at Stockbridge, where the average of eight samples washed up upon the banks gave 43½ per cent. of organic matter; a sample taken from the sides of the narrowed channel gave 34½ per cent. of organic matter; a sample collected from the bottom of the narrowed run, 80 yards below Stockbridge, gave 25 per cent. of organic matter; and still further down, at Malta Terrace, the sediment in the bottom of the run gave 32½ per cent. of organic matter (Table O.). In all of these instances the organic matter was, as usual, of an offensive and putrescent nature, and contained a decided proportion of nitrogen.
4. In the bed of the Water of Leith, in front of the Canonmills sewer, which contained organic matter to the extent of 31¾ per cent. (Table O.).
5. In the narrowed channel behind Warriston Crescent, and in the bed of the Water of Leith at St. Mark's Place, after the junction of the Edinburgh lade, when the average of nine samples gave 36 per cent of organic matter containing nitrogen. From this point down to the dam above Bonnington there is a stretch of water of nearly half a mile nearly stagnant and overlying a foul deposit of from one to three, and even at its lower parts to four feet in depth. Indeed, this stretch of water is an enormous cesspool open to the air, and the sedimentary matter is in a state of active putrefaction. At the dam above Bonnington the sediment contained 49¾ per cent. of organic matter, accompanied by 1·4 of nitrogen (Table O.); and,
6. In the bed of the Water of Leith at the boundary of Edinburgh and Leith at Bonnington Bridge, where one sample gave 27 per cent. of organic matter; below the junction of the Broughton Burn where the dried sediment contained 13¾ per cent. of organic matter, and at the dam above Junction Road Bridge, where the deposit is from one to two feet in thickness, and contained 27¾ per cent. of organic matter, accompanied by 0·7 of nitrogen.

The lades also, which now and again convey the whole or the major part of the Water of Leith, are not exempt from these organic sedimentary deposits. The lade which commences at the Water of Leith village, and traversing Edinburgh, is again discharged into the stream at St. Mark's Place, has an average deposit of 6 to 8 inches of organic matter at many places, and seven samples taken from the lade behind Ainslie Place, Moray Place, and India Place, and above Canonmills, gave the mean proportion of 25¾ per cent. of organic matter with 0·69 of nitrogen (Table O.).

In the harbour of Leith the putrefying deposit is diffused through a depth of one to two feet, and is necessarily mingled with fine sand

brought in by each tide. Samples of the deposit were collected at all the principal points on both sides of the harbour, and they were taken at a little distance from the banks so as fairly to represent the condition of the mud or deposit in the harbour. When the tide was out, it was observed that the whole bed of the harbour was composed of a black-coloured slimy foul deposit. 12 samples of the sedimentary matter lying towards the south-east side of the harbour gave an average of $28\frac{1}{3}$ per cent. of organic matter containing nitrogen, and 6 samples collected towards the north-west side of the harbour gave an average of 20 per cent. of organic matter with fully 0·60 of nitrogen (Table P).

These sedimentary deposits found in the river of Leith, from Coltbridge downwards to the harbour of Leith, and in all the mill lades connected therewith, are undoubtedly due to the discharge of the sewage of Edinburgh and Leith into the Water of Leith and the lades, and are not only foul and unsightly in themselves, but are far more noxious as hotbeds for the disengagement of unwholesome gases. The rapidity with which the gas escapes from these organic muds is such that at the dam-heads and in the harbour, the water floating above the putrefying stuff is perforated every moment with bubbles of gas, and so abundant are these that in many places the water presents the appearance of being a state of ebullition.

VIII. *The Gases evolved from the Muds or Sedimentary Matters.*

The gaseous emanations from the putrefying deposits in the bed of the Water of Leith, the lades, and the harbour, have received special attention in their examination. These gases are evolved more or less rapidly according to the depth of the organic mud, and the temperature of the season, and hence, in summer weather, the putrefactive processes proceeding more quickly, give rise to the disengagement of much gas even when the sediments are kept at rest, and lead to the evolution of large quantities whenever the deposit is agitated by a rod. In the bed of the Water of Leith, especially at Coltbridge, behind Ainslie and Moray Places, at St. Mark's Place down to the dam above Bonnington, at Bonnington Bridge, at the dam above Junction Road Bridge, and in the harbour of Leith, the disengagement of bubbles of gas is incessant and resembles a shower of rain falling. In the part of the Water of Leith where the channel is narrowed, as also in the lades, the evolution of gas is not so readily observed owing to the rapidity of the run of the water, but the slightest agitation of the bottom of the confined channels of the stream or of the lades at once causes the rapid disengagement of gases, so that there is no difficulty at any part of the Water of Leith from Coltbridge downwards in obtaining a good supply of gas for the purpose of examination as to its chemical composition.

In the collection of the gases, a bottle was filled with the water which was flowing over the deposit, and being inverted under the water with a funnel attached to the mouth, the sediment was agitated, when the bubbles of gas rose and entering the bottle displaced the water. A glass stopper luted with lard was inserted into the mouth of the bottle whilst under the water, and within three hours of the collection of the gases, the per-centage composition was determined by analysis. The results of the chemical investigation showed, that the gaseous emanations mainly consisted of gases which were combustible with a blue-white flame accompanied by smaller proportions of carbonic acid and oxygen. The proportion of the latter gas was small,

and there is little doubt that some at least of this oxygen may be regarded as derived from the gases dissolved in the water used in the collection and examination of the samples of air under analysis. The carbonic acid was determined by absorption with potash, and the oxygen was ascertained by the use of pyrogallic acid and potash, whilst the remaining gases were merely brought into contact with a lighted taper and observed to burn with a blue-white flame. The combustible gases which are well known to be evolved from decomposing plant and animal substances during putrefactive decay are marsh gas or light carburetted hydrogen, hydrogen, and carbonic oxide, and from the fœtid odour of the residual gas in all of the experiments, I have no doubt that these were accompanied, in the gases collected by me from those deposits of mud, by smaller proportions of other gaseous substances of a foul and noxious nature. In the majority of instances no traces of sulphuretted hydrogen were obtained when lead paper was introduced or when the odour of the gas was tried, but in the gases evolved from the sediment in the Water of Leith behind Warriston Crescent in Edinburgh, and that between the upper and lower drawbridges in the harbour of Leith, as also in those evolved from the mud off the jetty head at the entrance to the Victoria Dock, decided traces of sulphuretted hydrogen were obtained.

Fourteen samples of gas collected from sedimentary matters were examined. One sample of gas was taken from the mud or deposit in the Lochrin Burn sewer; two samples from the sediment in the bed of the Water of Leith at Coltbridge; two samples from the bed of the Water of Leith behind Moray Place; two samples from the sediment in the lade behind India Place; one sample from the bed of the Water of Leith below Stockbridge; one sample behind Warriston Crescent; two samples from St. Mark's Place; one sample from the dam at Junction Road Bridge; one sample from between the upper and lower drawbridges, and one sample from off the jetty head at the entrance to Victoria Dock (Table Q.). The proportion of carbonic acid in the gases ranged from 1·56 to 25·60 per cent.; of oxygen from 0·32 to 2·17 per cent.; and of other gases which were combustible with a blueish-white flame from 72·60 to 97 per cent.

The experimental results on the composition of the gases evolved from sedimentary matters in foul burns and waters teach the important doctrine, that the escape of sulphuretted hydrogen may scarcely, if at at all, be recognized, and yet large quantities of combustible gases, undoubtedly of organic origin, may be disengaged into the surrounding atmosphere, and consequently that the contamination of the air may occur without sulphuretted hydrogen being observed.

During the progress of these experiments attention was directed to a green substance consisting mainly of *Euglena viridis*, one of the Phytozoa, which was observed on the surface of the stagnating mud at the side of the Lochrin Burn, and in shallow parts of the Water of Leith as at St. Mark's Place, and which was said to neutralise in great part the deleterious effects of the gaseous exhalations, and even to lead to the disengagement of oxygen gas in large volumes. A considerable quantity of the green slime was separated as well as practicable from the underlying filthy sediment, and having been placed in a bottle till it was filled, the bottle was then inverted in a basin, and immediately gases began to be evolved. On testing these gases in about three hours, there were found carbonic acid 13·40 per cent., oxygen 1·60 per cent., and other gases, which were combustible with a blueish-white flame, 85 per cent. (Table Q.) It was proved, therefore, that this green slime does not practically lead

to the disengagement of oxygen, and indeed the gases which are evolved therefrom are essentially identical with those obtained from any foul deposit in a sewer or in water conveying sewage.

Moreover, the green slime, when collected from the surface of the sedimentary matter, and placed in a bottle which it filled about one third, and the remaining two thirds being left as common air, it was found that in 40 hours the composition of the atmosphere had so materially changed that a lighted taper was immediately extinguished on being introduced. A chemical analysis proved that the atmosphere left in the bottle contained 11·56 per cent. of carbonic acid, only 2·01 per cent. of oxygen, and 86·43 per cent. of other gases, which in their mixed state were not combustible and did not support combustion (Table Q.). These two experiments, therefore, demonstrated that practically the evolution of oxygen gas from the green slime covering a mass of putrescent filth was at a minimum and was highly problematical, whilst the disengagement from the mass, of carbonic acid and of combustible gases was undoubtedly certain. The green slime on being examined microscopically was found to consist mainly of minute organisms belonging to the *Phytozoa*, and which are alternately regarded as animals and plants. At present, the *Euglena viridis*, which forms a part at least of the green matter of these deposits, is considered to be a plant by some naturalists, and an animal by other authorities.

IX. *The Gases dissolved in the Waters of the Sewers and of the Water of Leith, &c.*

In all good natural waters there is present in solution a greater or less proportion of gaseous matter which the water has in great part dissolved out of the atmosphere. The gases present in healthy waters are carbonic acid, oxygen, and nitrogen; the two latter being in largest quantity, and the relative proportions of these two gases are, that for one volume of oxygen there are two volumes of nitrogen. These are not the proportions in which oxygen and nitrogen are present in the atmosphere, where there are for one volume of oxygen four volumes of nitrogen; but the greater solubility of oxygen than of nitrogen in water admits of a larger proportion of oxygen dissolving in the water, relatively, to the amounts of these gases in the atmosphere.

Two important offices are fulfilled by the oxygen which is dissolved in natural water. In the first instance, it supplies the air which fish require for their respiration, and without a due supply of which the fish become asphixiated and die; and, in the second instance, it oxidises any organic matters which pass into the water, and thus tends to purify the stream. It may be at once stated, however, that there is a certain limit to the power which oxygen possesses to consume organic matters, as in the act of doing so the oxygen enters into union with the elements of the decaying organic matter, and therefore ceases to be free oxygen, and cannot be recognised as such in the water. Moreover, whenever the oxygen has been used up in the decomposition of the organic matter, and there is still some refuse plant or animal substance left in the water, then putrefaction must follow and consequently foul gases be evolved.

The manner in which the oxygen dissolved in water acts upon foul matters contained therein may be observed from this, that organic substances principally consist of carbon, hydrogen, and oxygen, accompanied by a smaller proportion of nitrogen and minute quantities of sulphur and phosphorus; and where there is

oxygen dissolved in the water sufficient to act upon these, it oxidises the carbon into carbonic acid, the hydrogen into water, the nitrogen into nitric acid, the sulphur into sulphuric acid, and the phosphorus into phosphoric acid. Whenever the proportion of oxygen becomes exhausted, then the organic substance still lying beneath as sedimentary matter, or still floating along with the water cannot be oxidised, and must seek the elements of change within itself, and give rise to the disengagement of those combustible and foul gases which are characteristic of the putrefaction of refuse animal and vegetable substances.

In the examination of the gases dissolved in the waters of the sewers of Edinburgh, and of the Water of Leith, &c., I analysed the gases from 25 samples of water, and the details of the analyses are given in Table R. The spring-water, which is conveyed to Edinburgh in pipes for the service of the city, gives, as the results of these separate analyses, from 9·33 to 10·01 cubic inches of gas dissolved in one imperial gallon, and the per-centage composition of these gases is, carbonic acid 8·70 to 10·71, oxygen 28·77 to 29·47, and other gases (nitrogen) 59·82 to 61·90. The proportions of oxygen and nitrogen therefore are nearly 1 to 2, and the average amount of oxygen is fully 29 per cent. The two main feeders of the Water of Leith are the Harelaw reservoir, which flows into the Bavelaw Burn, and the Water of Leith, and, as the oxygen is the principal gaseous ingredient, and the details are given in Table R., I will simply mention here, that the per-centage of oxygen in the gases dissolved in the water of the Harelaw reservoir is 29·23, whilst in the other feeder, viz., the upper part of the Water of Leith, the per-centage of oxygen is 28·87. A sample of water collected at Currie Bridge, after the discharges from various works had passed into the stream, gave 22·06 per cent. of oxygen, and another sample of water collected still further down, at Gorgie Bridge, on a different day, gave 25·20 per cent. of oxygen, whilst two samples taken at different times from the Water of Leith at Coltbridge, just before mingling with the sewage of Edinburgh, gave respectively 22·22 and 22·20 per cent. of oxygen. It is thus evident that all the discharges thrown into the river in its upper parts, from the paper mills and other public works, are sufficient only to reduce the per-centage of oxygen from 29 to 22, and there is practically enough of oxygen still left in the water to oxidise more organic matter. The actual amount of oxygen taken up by the oxidation of the organic matters discharged from the mills may, however, be relatively greater than what is represented by the proportional difference between 29 and 22, as, during its course down to Coltbridge, the Water of Leith is exposed to the air, is, moreover, at certain parts, a rapid running stream, and occasionally flows over a rocky bed, and thus the water is liable to become aërated again, and will likely, as it loses oxygen in the oxidation of the organic matter present in the water, receive a fresh supply from the atmosphere. At all events, the Water of Leith arrives at the outskirts of Edinburgh, and at the point where the first portion of the sewage is discharged into it, as a stream which still retains enough of oxygen to keep all its other ingredients in a fresh condition.

Three samples of liquid were taken from the sewer known as the Lochrin Burn, one sample from the South or Moray Place sewer at Stockbridge, and one from Canonmills sewer, and the amount of oxygen present in each of these respectively was 3·33, 2·70, 2·10, 2·80, and 2·60 per cent. In other words, the proportion of oxygen was at a minimum, and it is questionable how far the remaining traces could

have the power of oxidising organic matters. At all events it was plainly observable that the spring water which is conveyed into the houses of Edinburgh, with oxygen present in the gases dissolved therein to the extent of fully 29 per cent., is afterwards found escaping from the sewers with the proportion of oxygen less than 3 per cent. on the average of five samples. Moreover, the sewage liquids were highly charged with organic matters capable of being oxidised, and possessing the power of abstracting the oxygen dissolved in very large quantities of water.

The effect of the sewage matters on the gases disolved in the Water of Leith is very decided, for whilst the gases in the Water of Leith at Coltbridge contain fully 22 per cent. of oxygen, the sewage conveyed by the Lochrin Burn, and numerous smaller sewers discharging into the stream, has the effect of reducing the per-centage of free oxygen to 4·20 per cent. by the time the water passes down to the Water of Leith village, and much organic matter still remains dissolved and suspended in the water of the stream. The water then finds its way over a rocky bed, and, apparently, it becomes aërated anew to some extent, for under the Dean Bridge the per-centage of oxygen in the gases has increased to 5·70, and behind Moray Place, near St. Bernard's Well, to 6·10, whilst on another occasion the proportion rose to 10·20 per cent. As the stream flows on, the aëration process proceeds, counter-balanced, however, by the oxidation of the organic matters already present, and being received every here and there, the proportions of oxygen fluctuate from 6·60 to 4·10 near Stockbridge, and at St. Mark's Place, after the lade joins, from 6·98 to 4·10. The gases dissolved in the waters of the lade which traverses Edinburgh, gave at India Place, on two different occasions, 4·76 and 6·40 per cent. of oxygen, and the water of the lade, just before joining the Water of Leith at St. Mark's Place, gave 5·40 per cent. of oxygen.

These experimental data afford proof that whilst the water of the Water of Leith arrives at Coltbridge charged with oxygen, that immediately in mingling with the sewage of Edinburgh, conveyed by the Lochrin Burn, the proportion of oxygen is reduced to a minimum, and practically the Water of Leith and the lade traverse the streets of Edinburgh destitute of the power of oxidising the organic matter discharged into it by the numerous drains and sewers. The result is that true putrefaction proceeds, and noxious gaseous exhalations are evolved from the decomposing organic matters. Under no circumstances is oxygen evolved from the decomposition of animal and vegetable substances, and as there is practically no purifying agent left in the Water of Leith, the extensive deposits of organic muds, which are found here and there and everywhere in the bed of the stream and lade, have no oxygen to consume or burn them, and are left to putrefy and exhale fulsome emanations.

X. *The Atmosphere in the Neighbourhood of the Water of Leith, &c.*

The gases evolved from the decomposing matters were generally recognised in the immediate vicinity of the Water of Leith conveying the sewage, as also in close proximity to the main drains or sewers. The odour was not that of sulphuretted hydrogen, but a heavy fœtid nauseous odour, specially observable immediately over the stream, and was doubtless due to the escape of gases produced by the putrefaction of the organic deposits. The state of the atmosphere was not only judged of by the test of the nose, but special experiments were made with a standard solution of permanganate of potash, so as to determine

the relative purity or impurity of the atmosphere in the vicinity of the Water of Leith, and at some distance therefrom. The employment of the permanganate of potash for the detection of impurities in the air was first suggested by Dr. Angus Smith of Manchester. The standard solution which was used in making the analyses of the air in connection with this enquiry was of such a strength that 250 grains, by measure, of the permanganate of potash solution were decolorised by 0·027 of a grain of fruit sugar, and the same quantity of permanganate was decolorised by 0·0075 of a grain of metallic iron.

In the collection of the samples of the atmosphere at various localities, half gallon stoppered bottles were taken, and after being rinsed with sulphuric acid and nitric acid, were thoroughly washed with water, treated with a little permanganate of potash, re-washed with distilled water, and then filled with pure water and the stoppers inserted. When the bottle was intended to be filled with air a siphon was introduced to the bottom of the bottle, and the water being run off by the siphon, the air entered at the mouth of the bottle without being washed by the water. The bottle was re-stoppered and the contents were tested as quickly as possible.

In using the standard test solution of permanganate of potash for the examination of the air, an improvement in its mode of application was suggested by Dr. Penny, and carried out in these investigations. Instead of employing the coloured solution, little by little, so long as the colour was destroyed, which leads to great irregularity in the length of time of agitation, and is, moreover, tedious, a series of standard tubes were filled with solutions of the permanganate of potash of varying strength, so as to form a sliding scale, where the full or undiluted colour was No. 1, and the succeeding numbers contained more and more water till No. 11 was nothing but water. The following short table will exhibit the scale which was adopted as the test standard:

Test tube.							Degree in scale.
No. 1	contained	250 grains	of the solution of permanganate of potash, and	no water			100
„ 2	„	225	„	„	25 grs.	water	90
„ 3	„	200	„	„	50	„	80
„ 4	„	175	„	„	75	„	70
„ 5	„	150	„	„	100	„	60
„ 6	„	125	„	„	125	„	50
„ 7	„	100	„	„	150	„	40
„ 8	„	75	„	„	175	„	30
„ 9	„	50	„	„	200	„	20
„ 10	„	25	„	„	225	„	10
„ 11	„	0	„	„	250	„	0

The mode of testing the air in the bottles consisted in adding 250 grains by measure of the standard solution of permanganate of potash, and agitating the test solution with the air for five minutes, when the solution was poured into a test tube, and the depth of colour still remaining observed, and contrasted with that of the solutions in the standard test tubes. If one half of the colour was lost, the liquid from the bottle would resemble in depth of tint that in test tube No. 6, which contains 125 grains of the permanganate of potash solution, along with 125 grains of water, and the degree in the scale of purity would be 50; absolute purity being 100, and the complete decolorisation of the liquid being 0.

31 samples of air were collected at various parts on different occasions and were tested (Table S.). On the 7th April, nine samples were tested, and whilst the degrees of purity of the air at three stations in Edinburgh away from the influence of the Water of Leith were respectively (100 being absolute purity) 85, 70, and 67, and the air at the Water of Leith at Coltbridge, before being mingled with sewage was 75, the atmosphere in the immediate vicinity of the sewers and of the Water of Leith conveying sewage had its degree of purity reduced to 63, 58, 55, and 55, and in one instance, as below the dam under the Water of Leith village, the 100 of standard colour was totally destroyed, a second 100 was similarly bleached, and of a third 100 only 20 remained. The reason of the very impure state of the air at this point lies in the fact that the water conveying the sewage, in falling over the dam, is dashed into foam, and the impure gases tend more quickly to escape, and thus contaminate the surrounding atmosphere to an extent more than in ordinary circumstances.

On the 9th April, 16 samples of air were collected and examined. Three samples taken in Edinburgh in places away from the Water of Leith, and one sample collected in Leith at a distance from the polluted stream, gave respectively the degrees of purity of 80, 75, 80, and 80, and one sample taken from the harbour at the Victoria Dock head gave 70 ; whilst the air collected under the immediate influence of the Water of Leith, conveying the sewage of Edinburgh and Leith, gave respectively 60, 60, 50, 60, 60, 55, 55, 55, 60, 50, and 55. On the 14th April six samples of air were collected and examined, when it was found that over the Water of Leith above Coltbridge, and before mixture with sewage, the degree of purity was 80, whilst over the sewers, and the Water of Leith conveying sewage, the degrees of purity were 68, 66, 70, 64, and 70 respectively.

These experimental results demonstrated that the atmosphere in the immediate neighbourhood of the Edinburgh and Leith sewers and the Water and Harbour of Leith contains more impurity than what is present in those parts of Edinburgh and Leith which are away from the influence of the foul gases emanating from the putrefying substances in the Water of Leith.

XI. *The Vegetable and Animal Life in the Water of Leith, &c.*

In the bed of the Water of Leith above the influence of sewage as at Gorgie dam, which is about a mile above Coltbridge, the stones over which the water flows have plants, such as moss, attached to them, and these plants are found on the stones in the bed of the streams conveying water practically free from putrescent matter ; but from the entrance of the Edinburgh sewage at Coltbridge downwards to the harbour of Leith, the stones in the bed of the stream are covered with offensive organic growths, which are characteristic of waters conveying sewage and capable of decomposing and evolving unwholesome gases. Indeed, not only are the stones covered with such vegetable growths, but everything in the bed of the river, such as arrested portions of trees, become thickly coated. They are also seen in the sewers called the Lochrin Burn sewer, the Broughton Burn, and the Bulls Stank sewer at Lovers Loan as it leaves Edinburgh, in all of which the bottom and sides are more or less covered with the growths. Even in the narrowed part of the channel of the Water of Leith, where the run of water is great, these organic matters are abundant, and likewise in the bottom and sides of the lade which traverses Edinburgh. All the twigs and branches of trees which hang

down into the Lochrin Burn sewer, and into the water of the lade, as from the gardens behind Ainslie Place and Moray Place, have these growths adhering in long streamers, rendered bulky and doubly foul by the accumulation of entangled filth. These growths principally consist of those low forms of vegetable life which are regarded by some naturalists as *Fungi*, and by others as *Algae*, and they are accompanied by masses of animals belonging to the family of *Vorticellidæ*, including the genera *Vorticella*, *Carchesium*, *Zoothamnium*, and *Epistylis*. Much of the organic matters which are found entangled in the branches of trees hanging into the lades and open sewers, as also of the organic deposits which are found in the beds of the Water of Leith and of the lades, are composed of the decaying remains of such growths.

The chemical analyses of these organic growths (Table T.) demonstrated, that even when examined with all the adhering entangled filth, when dried, they contained on the average of seven samples, 50·61 per cent. of organic matter, of which 0·84 consisted of nitrogen. These organic matters are being constantly detached from the stones, &c., on which they grow, and the torn off fragments float down the stream or lade and form part of some deposit in a rocky pool or in the still water above a dam. A considerable proportion of the deposits observed in the bed of the Water of Leith behind Ainslie Place and Moray Place and in the large cesspool at St. Mark's Place, consisted of those organic growths passing into an active state of putrescence. During the spring months the growths are apparently stronger and form longer streamers than during the summer months. The temperature of the latter is higher and facilitates changes such as the disintegration of the mass. These growths appear to be the last stage of organic life which will inhabit foul water, but in places where in the spring many patches of the growth were observed, in summer hardly any was to be noticed. This disappearance, in part at least, of the growth is to be attributed to the more foul state of the sewers and Water of Leith in summer, which leads in some places to such a rapid putrefaction as even to arrest the development of this comparatively simple form of organic life.

In the whole course of the Water of Leith from Coltbridge downwards not a single fish could be seen. The animal life which were specially visible to the naked eye consisted of colonies of small red worms, which were very abundant in many places, and are regarded as the last remnant of animal life which will exist in water contaminated by sewage. These minute red worms are a kind of *Nais*, belonging to the family of *Naidina*, and are named *Tubifex rivulorum*. They are found in greater abundance in the Water of Leith during spring than in summer, apparently from the more active putrescence of the sedimentary matter leading in the summer to the disengagement of a more full supply of noxious gases which even these minute worms cannot survive. In many places, where in spring the bed of the stream or of the lade harboured myriads of even this inferior type of animal life, there was hardly a specimen to be had, and this was doubtless due to the more rapid putrescence of the deposits. Abundance of animalculæ, including the *Paramaecia*, were found in the Water of Leith at all seasons of the year.

One curious effect of sewage upon animal life was observed by me in the harbour of Leith. Two wooden piers stretch some distance into the sea ; they are constructed of the same kind of timber and are of the same age. The West pier is not liable to be influenced by sewage passing down the harbour as the tide sweeps the sewage from it, and

the wood of this pier is nearly eaten through in some parts by the *Teredo*, a bivalve (Lamellibranchiate) mollusc, which is well known to be destructive to wooden erections in the sea. But the East pier is washed by the sewage water, and apparently from the disengagement of sulphuretted hydrogen, which is specially formed when sewage meets sea water, there is not a single *Teredo* to be seen at its work of drilling holes in the wood. The sewage in such circumstances therefore appears to be beneficial in retarding the ravages of this troublesome mollusc.

Independently of the putrefaction of the sedimentary deposits fish might live in water which contained nearly the proper proportion of oxygen, but the water of the Water of Leith from Coltbridge downwards is almost devoid of oxygen, and fish can no more live in water containing no oxygen than land animals could live in an apartment destitute of air.

It it worthy of note, as evidence of the state of the water of Leith and its incapacity to support the life of fish, that during the summer of 1864 a shoal of young herrings attempted to enter the harbour of Leith, and those herrings turned over on account of the foulness of the water and the majority died upon the spot.

XII. *The Purification of the Water of Leith.*

The foul and abominable condition of the Water of Leith when polluted by the sewage of about 100,000 of the inhabitants of Edinburgh and Leith, and the consequent danger to health of the communities of both towns who inhabit houses in the vicinity of the stream, led to strenuous efforts being made to remove the cause of the evil and provide for the purification of the water of Leith, which at the present time is practically an open sewer, by the interception of the sewage and its conveyance by a main drain to the sea. The scheme which was suggested and approved of by both corporations, and which, having received the sanction of Parliament, is now in course of being carried out, provides for a main drain from Coltbridge down to Leith, and then out to sea to the Black Rocks. The whole length of the pipe and culvert will be about 5¼ miles for the main work, and 2 miles for branches, and the gradients will be from 1 in 40 to 1 in 600: the latter being the gradient at the outlet. The length of main pipe and branches in the Edinburgh district is from 4 to 5 miles, and the estimated cost of that part of the work, viz., from Coltbridge down to the boundary of Edinburgh and Leith is 29,314*l.*; whilst the length of the main pipe and branches from the boundary of Edinburgh and Leith at Bonnington to the Black Rocks at sea is 9,600 feet, and the estimated cost of that part of the work is 25,686*l.* The whole estimated expense of the work is 55,000*l.* which is a small sum in comparison with the 5,000,000*l*, now being expended by London in a similar measure, and the cost of the works is to be defrayed by a rate limited to 2*s.* 6*d.* per pound rental for one year, on all the property, within the parliamentary boundaries of Edinburgh and Leith, draining into the water of Leith, and contributing to the sewage, with the addition of a grant of 4,000*l.* from the Leith Docks Commission.

The main drain is to be an iron pipe throughout the greater part of its length, though at a portion of its course it will be a brick culvert. At the Lochrin Burn sewer and the Broughton Burn sewer there will be cesspools for the arrestment of dead cats and dogs and other materials thrown into these sewers where they run as open ditches, but all the other drains and sewers will be directly connected with the main drain,

leaving overflow pipes for the discharge of the comparatively pure water of high floods. The main drain will intercept all the ordinary sewage of Edinburgh and Leith, which naturally drains into the water of Leith and the lades. The apertures of the different branches and connections with the sewers will be considerably larger than the size required for the present flow of sewage, so that a reasonable fall of rain will also be received in the main drain.

The diameter of the entrance to the main drain or iron pipe at its commencement at Coltbridge and where the Lochrin Burn sewer enters will be 18 inches, and it will convey away 360 cubic feet of sewage per minute; at Stockbridge, where the large North and South (Moray Place) sewers enter, the iron pipe will be 30 inches in diameter and be capable of carrying 1,616 cubic feet of sewage per minute. At Canonmills, where another large Edinburgh sewer joins, the diameter of the main drain will be increased to 33 inches. At the boundary of Edinburgh and Leith, at Bonnington, the drain will be a brick culvert 4 feet 6 inches by 3 feet; and at Leith, and passing out to sea at the Black Rocks, the iron pipe of the main drain will be 3 feet 6 inches in diameter, and be capable of discharging at low water 2,200 cubic feet of sewage per minute. As the pipe is carried past the south-east side of the harbour of Leith it will have five or six overflow pipes at the level of high water, so that should there be a flood in the pipes, and very high tides at the same time, there will be a certain overflow into the harbour; but this will only occur in exceptional cases, and then only into the harbour during high water, and when there is abundance of water to dilute the sewage and carry it off during the receding of the tidal water. The main drain only intercepts the sewage of South Leith, but simultaneously with this measure being carried out, the Corporation of Leith is bound to intercept the sewage of North Leith and carry it by an independent pipe to the sea.

The maximum amount of ordinary sewage from Edinburgh and Leith, which is discharged into the Water of Leith, and will be received in the main drain, is 574 cubic feet per minute; but this amount will be increased in the course of time by building operations, and the increase in the number of dwelling-houses and possibly of manufactories. The main pipe will certainly carry double the amount of the sewage water, and at ordinary times it may carry three times and even four times the amount of sewage water. During a flood of rain-water, the first portions of the rain will serve, from the extra force of the run, to clean out the sewers into the main drainage pipe, and when all the sediment in the sewers has been swept into the pipe, and the rain-water increases till the sewers convey more than four times their ordinary discharge, then, whilst much will still be carried away by the main drain, all the excess which will be in the upper part, and will merely, at the worst, be sewage mingled with three or four times its own volume of rain-water, will be discharged into the Water of Leith. Not only will the sewage be largely diluted when it flows from the drain into the stream, but the river itself will generally be in flood at those times, and the sewage will thus pass into the Water of Leith so much diluted with water that it will be comparatively innocuous, and will be immediately swept onwards with the flood-water.

That a flood of rain in the sewers is generally accompanied by a flood of water in the river has been placed beyond doubt by the accurate observations and measurements made by the Engineers of

the Drainage Bill, and the following Table gives the results of the simultaneous gaugings of the river and of the Lochrin Burn sewer :—

	Water of Leith. Water going over the waste wiers at the dams, and over and above the 1,600 cubic feet per minute passing down the lades. Surplus water at dams in cubic feet, per minute.	*Lochrin Burn Sewer.* As it discharges into the Water of Leith at Coltbridge. Flow of water in cubic ft., per minute.
15 March 1864	13,850	309
16 „	8,250	237
17 „	8,255	221
18 „	4,900	194
19 „	3,950	194
21 „	2,355	203
22 „	3,300	213
23 „	1,530	178

During the winter season water is always going to waste over the wiers, but in summer weather the flow of any water over the dams is exceptional.

The average rain-fall in Edinburgh is 24 inches annually, and judging from the observations of several years it is found that a rain-fall of ·64 in. per day, which is required to produce a flow of one cubic foot a minute per acre into the sewers, and would consequently increase the usual flow of water twofold, can only be exceeded ten times in the course of a year ; so that if the main-drainage pipe has the capacity to convey double the quantity of the ordinary sewage, the pipe will only refuse to take in the whole contents of the sewers in 10 days of every year. If the main drain can carry triple the amount of the ordinary sewage, the quantity of rain required to produce more than this quantity occurs so seldom that the junction pipes will only overflow 1½ days in the year ; and if the main drain can carry four times the quantity of the ordinary sewage, then it will only permit of the discharge of part of the flood water into the Water of Leith in seven days in every eleven years.

XIII. *The Condition of the Water of Leith as contrasted with the State of the Thames.*

In drawing this paper to a conclusion it may be interesting and instructive to contrast the present state of the Water of Leith with the condition of the Thames, and then to sum up the principal results of the investigations undertaken by me in connection with the contamination of the Water of Leith by the sewage of Edinburgh and Leith.

The condition of the Thames, as it courses through London, is much less foul than the Water of Leith as it traverses Edinburgh. The experiments made by Graham, Miller, and Hofmann show there is very little increase in the amount of organic matter in the Thames at London than there is at Thames Ditton, which is above the tidal influence, and therefore not liable to be contaminated by the sewage of London. The proportion of organic matter in the water at Thames Ditton is 2·29 grains per gallon, and in the water supplied by the Lambeth Company and derived from the Thames, London, the organic matter is only 2·59 grains per gallon. Practically, therefore, the Thames water does not materially increase in the proportion of organic matter as it flows down to London, and this statement will be more decidedly borne out by the experimental results obtained by Hofmann and Witt

on the water of the Thames from Kew Bridge down to the Victoria Dock. The following Table gives the experimental results :—

	Solid constituents in grains per gallon.		
	Organic.	Mineral.	Total.
Water at Kew Bridge - -	1·844	23·067	24·911
„ at Crab Tree Slip, near Fulham -	1·992	20·124	22·116
„ opposite lock at Wandsworth -	2·359	23·672	26·031
„ at Westminster Bridge - -	1·937	23·496	25·433
„ at London Bridge - -	2·194	23·676	25·870
„ at Victoria Dock - -	2·032	25·649	27·681
Mean - -	2·059	23·281	25·340

The mean proportion of organic matter in the Thames water, therefore, is only two grains, which in one imperial gallon is only about $\frac{1}{3500}$th of the weight of the water, and there is hardly any increase from Kew down to London Bridge. This extraordinary result is to be fairly attributed in part at least to the quantity of oxygen in the water, which acts readily on the organic matter and consumes it. The tide appears to have some effect upon the proportion of organic matter as well as saline matter in the Thames, doubtless due to the forcing back of the sewage water, and the disturbance of the sediment in the bed of the Thames. Thus Letheby found that at Woolwich at high tide the proportion of saline matter in the imperial gallon was 453·6 grains and at low tide was 60·6 grains, and at London Bridge the saline matter at high tide was 26·5 grains and at low tide 24·9 grains ; whilst the organic matter in the water at London Bridge, at high and low water, was respectively 3 grains and 2·7 grains : of the latter 1·6 grains were in solution and 1·1 in supension. The sea, therefore, penetrates to London Bridge. Odling, in experiments made on the Thames water at Greenwich, found that on the average of many experiments, the amount of matter dissolved in the water at high tide was 191·23 grains, of which 16·28 grains were organic matter, and at low tide the proportion of matter was 45·91 grains, of which 6·13 grains were organic. It would thus appear that the average amount of organic matter in the Thames at Greenwich is nearly three times more at high water (16·28 grains) than at low water (6·13 grains). Experiments made by Odling at Greenwich at neap tide showed that at high water the matter carried by the water was 58·87 grains, of which 4·69 grains were organic matter, and at low water 27·87 grains, of which 2·64 grains were organic matter.

The mean proportion of organic matter dissolved and suspended in the Water of Leith, after receiving the successive quantities of the sewage of Edinburgh, and as the stream flows past the city and onwards to the harbour of Leith, is much greater than what is found in the water of the Thames. Indeed, as the Water of Leith at certain parts of its course, in summer or dry weather, only conveys the discharges of the common sewers, it follows that the water in the bed of the stream is almost pure sewage. During the winter and spring months, however, the whole of the natural water of the stream is not diverted into the lades, and at those times, the sewage is mingled with more or less ordinary water flowing down the bed of the river.

The *average* proportions of organic, saline, and earthy matters dissolved and suspended in the drainage liquids from Edinburgh and Leith, and which are discharged into the Water of Leith, may be observed from Table U., whilst the amount of organic matter in the imperial gallon of the liquids conveyed by the principal sewers may be more clearly observed from the following table :—

Number of Samples.	Place of Collection.	Mean Proportion of organic matter dissolved and suspended in one imperial gallon.
18	Lochrin Burn Sewer, west of Abattoir or Slaughter-houses	45·42 grs. equal to $\frac{1}{1550}$th of weight of water.
15	Lochrin Burn Sewer, above Caledonian Distillery	44·38 „ $\frac{1}{1600}$th „
20	Lochrin Burn Sewer, above Coltbridge	60·54 „ $\frac{1}{1150}$th „
10	North Sewer, at Stockbridge	21·56 „ $\frac{1}{3200}$th „
12	South (Moray Place) Sewer, at Stockbridge	31·79 „ $\frac{1}{2150}$th „
21	Canonmills Sewer	23·70 „ $\frac{1}{2900}$th „
11	Broughton Burn Sewer, Bulls Stank Sewer, Coal Hill Sewer, Drawbridge Sewer — Discharging near and at Leith.	57·58 „ $\frac{1}{1200}$th „

When the contents of the above sewers are discharged into the Water of Leith they necessarily raise the relative amount of organic, saline, and earthy matters in the water of the stream, as may be specially observed from Table V., which gives the *average* proportions of such substances dissolved and suspended in the Water of Leith, from immediately above Coltbridge, where the sewage begins to enter, down to the Harbour of Leith ; and the following table gives the various quantities of the organic matter dissolved and suspended in the Water of Leith at the principal stations, from its sources down to the sea.

Number of Samples.	Place of Collection.	Mean Proportion of organic matter dissolved and suspended in one imperial gallon.
1	Water of Leith above Balerno Bridge (source)	2·00 grs. equal to $\frac{1}{3500}$th of weight of water.
1	Water of Leith, Harelaw Reservoir (source)	2·56 „ $\frac{1}{3000}$th „
23	Water of Leith, above Coltbridge, after receiving discharges from Works and before being mingled with the Sewage of Edinburgh and Leith	5·07 „ $\frac{1}{1400}$th „
	Water of Leith, from Coltbridge downwards, and whilst receiving successive quantities of Sewage.	
1	Water of Leith, down to Water of Leith Village	9·72 „ $\frac{1}{700}$th „

Number of Samples.	Place of Collection.	Mean proportion of organic matter dissolved and suspended in one imperial gallon.
6	Water of Leith, under Dean Bridge - - - -	10·15 „ $\frac{1}{70000}$th „
6	Water of Leith, behind Moray Place - - - -	9·61 „ $\frac{1}{70000}$th „
6	Water of Leith, above Stockbridge - - -	9·91 „ $\frac{1}{70000}$th „
9	Water of Leith, below Stockbridge - - - -	23·16 „ $\frac{1}{70000}$th „
1	Water of Leith, at Warriston Crescent - - -	17·72 „ $\frac{1}{70000}$th „
8	Water of Leith, from lade behind India Place, and at Beaver Hall - - -	10·82 „ $\frac{1}{70000}$th „
18	Water of Leith, St. Mark's Place - - - - -	26·45 „ $\frac{1}{70000}$th „

It will thus be observed that the Water of Leith, as it leaves Edinburgh, contains fully ten times the quantity of organic matter which is found in the Thames at London Bridge, and necessarily the offensiveness of the water must be correspondingly greater.

The solid matter discharged by the sewage of London in one day is calculated to amount to 250 tons, and as 50 days elapse before it is capable of reaching Gravesend, it must by that time have mingled with 250 millions of tons of water, and the oxygen contained therein is no doubt sufficient to aid in the decay or combustion of the organic matter, and thus consume it, without putrefaction (in the true sense of the term) setting in. Indeed, before it reaches Gravesend, the greater part of the organic matter must be decomposed, and even at the worst, the water can only have present 12,500 tons distributed amongst 250,000,000 tons of water, which is only 2 ozs. of solid matter in a ton of the water, or $\frac{1}{200000}$th part of the weight of the water. In the investigations relating to the sewage of London and its effects on the Thames, and the injury to health inflicted thereby, it is conclusively shown that the greatest part of the nuisance lies in the sedimentary matter which lines the banks and is in an active state of putrefaction; and the same conclusion has been come to by me in regard to the foul deposits in the bottom of the lades and in the bed of the water and harbour of Leith. The *average* composition of these sedimentary matters collected from the bottom of the open sewers discharging into the Water of Leith, and from the bed of the Water of Leith, of the lades, and of the harbour, is given in Table W. in a condensed form.

The mixture of sea water with the sewage in the harbour of Leith causes, besides the ordinary putrefaction, the production of sulphuretted hydrogen in quantity, and this was specially observable in the mud which was brought up from mid-channel of the harbour by a dredging machine during one of my visits to the Water of Leith. A similar disengagement of sulphuretted hydrogen under like circumstances has been observed previously, especially where organic matter meets with sea water in hot climates, such as on the coasts of Africa, and it has also been observed in part to occur in the Thames, and give rise at least to an increase in the amount of sulphuric acid in combination with Thames water at high tide as

compared with low tide. The disengagement of sulphuretted hydrogen in tropical regions when organic matter and sea water meet is so decided that the odour and other effects of sulphuretted hydrogen have sometimes been observed 27 miles at sea from the mouths of rivers.

The gases evolved during the decomposition of the sedimentary matters lying in the open sewers, the lades, and in the bed of the Water of Leith do not, however, contain much sulphuretted hydrogen (hydrosulphuric acid), but mainly consist of carburetted hydrogen and other combustible gases and vapours which are known to be evolved during the putrefaction of organic matters. The *average* composition of twelve samples of these gases, collected from five stations, is given in Table X.

The gases dissolved in the waters of the sewers, the lades, and the Water of Leith are equally characterized by the minute proportion of sulphuretted hydrogen which is present at any time in these waters, and the amount of which is so slight, that, in many instances, it cannot be recognised. The *average* composition of twenty-five samples, collected from six stations, is given in Table Y. The gases evolved from the decomposing and putrefying deposits rise up through the water which flows above, and pass into the atmosphere, and the liquids also tend to interchange their foul gases with the gaseous constituents of the air, and hence the neighbouring atmosphere becomes contaminated by the evolution of those fœtid gases. The *average* relative purity of thirty samples of the atmosphere collected in districts away from and near the open sewers, lades, and the Water of Leith is given in Table Z.

XIV. *General Conclusions.*

In considering the whole subject of this paper, and contrasting the results of the investigation made by me relative to the Water of Leith with those made in London on the Thames, and knowing the great benefits derivable from improved drainage in the lessening of the rate of sickness and of death in all localities where effective and judicious sanitary measures have been carried out, I beg to submit the following conclusions on the contamination of the Water of Leith by the sewage of Edinburgh and Leith :—

I. That the Water of Leith, above the influence of the sewage of Edinburgh, is a small stream of water of a peaty or mossy nature, which has its original amount of organic and saline matters increased by discharges from paper mills and other public works, but arrives at Edinburgh in a condition not liable to putrefaction and containing a good proportion of free oxygen gas.

II. That the Water of Leith, immediately above Coltbridge, and before admixture with the Edinburgh sewage, is comparatively free from foul deposits and from unsightly organic growths, and does not evolve unwholesome gases into the surrounding atmosphere, and thus contaminate the air of the vicinity.

III. That the Lochrin Burn and other sewers and drains of Edinburgh convey large quantities of offensive liquids with decomposing organic matter in solution and mechanical suspension, and discharge such into the Water of Leith at many points from Coltbridge downwards.

IV. That the organic matters so conveyed into the Water of Leith principally consist of the decomposing effete matters of the

animal system, including the solid excrements or fæces, and even in comparatively cold weather evolve abundantly offensive odours.

V. That the sides and bottom of the open sewers, of the lades which traverse Edinburgh, and the bed of the Water of Leith from Coltbridge downwards, are more or less covered with offensive organic growths characteristic of streams and open drains which convey sewage matters.

VI. That the bottom of the open sewers, the bottom of the Edinburgh lades, the bed of the Water of Leith from Coltbridge downwards, and the harbour of Leith, are more or less thickly covered with organic matter in an advanced stage of putrefaction, which fills up the rocky pools at certain parts and renders the dams vast open cesspools.

VII. That the signs of animal life visible to the naked eye in the Water of Leith, after commencing to receive the sewage of Edinburgh, consist mainly of multitudes of minute worms, which are characteristic of waters conveying sewage, and may be regarded as the last remnant of animal life which will survive in such a locality, and even these die off in many places during the summer weather, and when the putrescence of the organic matter proceeds more rapidly.

VIII. That the organic sedimentary matters which are deposited in the bed of the Water of Leith from Coltbridge downwards, in the harbour of Leith, and in the various lades below Coltbridge, are in a state of active putrefactive fermentation, and the slightest agitation of the deposit gives rise to the abundant evolution into the surrounding atmosphere of those gases which are well known to be evolved from decomposing vegetable and animal matters.

IX. That whilst all healthy water contains a considerable proportion of oxygen gas dissolved therein, which can act in consuming any organic impurities which may pass thereinto, the Water of Leith, after mixing with the sewage matters, is found to be practically devoid of oxygen gas, and the contents of the sewers are found equally devoid of oxygen gas, so the waters of the sewers and of the Water of Leith from Coltbridge downwards are practically devoid of any purifier, and must allow their contents to become putrescent.

X. That the putrescence of the organic liquids and deposits in the open sewers, the bottom of the lades, and the bed of the Water of Leith, in all weathers, but especially in summer, and the evolution of noxious gases therefrom, lead to the sensible contamination of the surrounding atmosphere, and consequently decrease the purity and healthiness of the air.

XI. That, taking all these circumstances into consideration, I am decidedly of opinion that the discharge of sewage-matters into the Water of Leith in any weather, but especially in the warmer months, leads to the accumulation of organic matter of a most offensive nature, and that the consequent putrefaction of this organic matter gives rise to the evolution of gases which are highly offensive and pernicious, and must render the neighbouring localities more or less unwholesome.

XII. That the condition of the Water and Harbour of Leith is much more noxious than any part of the Thames, as the proportion of organic matter is much greater, and the rocky pools and dams afford more obstacles to the flow of the sewage, and that the time had certainly arrived when a main-drainage scheme was absolutely required for the purification of the Water of Leith.

The lengthened investigation into the condition of the Water of Leith, and the contamination of the stream with the sewage of Edinburgh and Leith, has brought prominently before me the great injury done to rivers by the sewage of populous places. The full effect of such contamination cannot be observed by the simple inspection or even the analysis of the water, so as to determine merely the proportion of organic matter which may be present therein, but can only be learned by a thorough examination of :—

1. The liquids conveyed by the sewers and rivers :
2. The sedimentary matters lying in the bottom of the open sewers and the bed of the rivers :
3. The gases evolved during the decomposition of these sedimentary matters :
4. The gases dissolved in the waters ; and
5. The atmosphere in the neighbourhood of the open sewers and rivers conveying sewage.

The injury done by sewage in the contamination of the waters of streams and rivers is not the only grievance which is sustained by the improper discharge of the drainage of houses. In the smaller towns and villages where no drainage system is carried out, and where no regular water supply is introduced, a plan of receiving water and discharging drainage is adopted which is positively unwholsome and detrimental.

In the better class of dwellings in non-drainage localities, each house, when built, is provided immediately underneath or in a small front or back plot, with two holes, one of which is a well with a pipe leading to the house and the second is a cesspool with a pipe coming from the house, so that the water is drawn from the one hole and is returned to the other. The well is in most instances dependent for its supply on the percolation of water from the sides and bottom, and thus it draws water from the neighbouring ground ; whilst the cesspool of the house is not many yards away, and the liquid discharged from the water-closets and kitchen sinks, is run into the cesspool, oozes through the soil and enters the well. That cesspools are related to wells in this manner is abundantly evident from the examination of the ground, and the analysis of the water from the well. The ground around the cesspool is more or less impregnated with organic matter, and whilst the more solid parts of the impurities are left in the ground, the more liquid portions enter the well. Occasionally the sides of the well are stained with an offensive slime, and in many instances, when the wells are cleared out, they are found to contain a large quantity of decomposing organic sediment. The sewage when discharged from a house in a fresh state is comparatively harmless ; but when putrefaction sets in, and especially if the matter is arrested in cesspools in the immediate neighbouring ground, there is much danger from the contamination of the wells, and the escape of noxious gases into the surrounding atmosphere. During the process of putrefaction, a portion of the offensive matters become liquid and are dissolved in the water, and whilst, in some instances, the organic matter permeates the

soil and communicates a greenish yellow colour, and an offensive odour and taste to the water; yet in most cases the water does not betray from its colour, odour, or taste, the slightest evidence of being contaminated by the products of offensive animal and vegetable matters which have undergone putrefaction and decay. For some years my attention has been specially directed to the influence of cesspools and other accumulations of organic matter on waters intended to be employed for household use, and I have repeatedly examined waters of pleasing appearance which were regularly used for drinking and for culinary purposes, and were even famed as first class waters for general dietetic use, and which, on chemical examination, proved themselves to contain in one imperial gallon from two to thirty grains of organic matter and the products derived from its decomposition.

The results of the many experiments and observations which I have made on the pollution of the Water of Leith and other streams and rivers, as also on the contamination of wells, by the sewage of houses and towns, have demonstrated the following general conclusions on the important question of the influence of drainage materials on natural waters:—

I. That the discharge of the sewage of towns and cities into streams and rivers pollutes the water by the admixture of much organic matter in a state of active putrescence.

II. That the more solid part of the sewage discharged by drains into streams and rivers, accumulates in all pools, and above all dams, cauls, or other obstructions, and forms a deposit of decomposing filth.

III. That the organic matter conveyed by the sewers into natural waters, is more or less acted upon by the oxygen dissolved in the water, and is in part consumed thereby.

IV. That the combustion of part of the organic matter necessitates that the oxygen gas dissolved in the water, and which is the natural purifier, should be abstracted therefrom, and subsequently the remainder of the organic matter must pass into a state of putrefaction.

V. That the sedimentary matter which is conveyed by sewage, and which lodges in the pools and above obstructions, as well as on the banks of the streams and rivers, is of a nature to be actively putrescent.

VI. That the organic matter dissolved in the water, and the organic deposits, are constantly evolving considerable volumes of gases which mainly consist of combustible gases, or those which are known to be given off during the putrefaction and decomposition of animal and vegetable matters.

VII. That the gases evolved during the putrefaction of the organic substances contaminate the atmosphere of the neighbourhood, and necessarily decrease the healthy nature of the air.

VIII. That when the proportion of sewage is comparatively little, the waters of streams and rivers may contain enough of oxygen to consume much of the organic matter, but this necessitates that the proportion of oxygen be diminished, and the water be rendered more or less irrespirable for fish.

IX. That natural waters conveying relatively a large proportion of sewage matter are totally unfit for the sustenance of the life of fish, as the oxygen, for their respiration, has been

abstracted, and the water has become practically devoid of that gas.

X. That, in districts where defective or no drainage is carried out the well waters are liable to be contaminated by the decomposing organic matter which is discharged into the neighbouring cesspools, and impurities derived therefrom may be present in well waters which are devoid of colour and odour, have no unpleasant taste and may be popularly known as good waters.

XI. That water contaminated by sewage becomes more or less unfit for household purposes, and even when the proportion of sewage is small, and the water may be comparatively clear, it is unwholesome as a beverage, and is unfit for culinary purposes.

XII. That it behoves all parliamentary and municipal authorities to pass and enforce measures for the suppression of the causes of the pollution of wells, streams, and rivers, and thus arrest the evils which are necessarily attendant on the contamination of streams, rivers, and other waters by the sewage of cities, towns, villages, and other populous places.

(Signed) STEVENSON MACADAM.

Table A.

Liquids collected from the Drains and Sewers discharging into the Water of Leith.

Temperature.		Place and Time of Collection.	In solution.			In suspension.			One imperial gallon contains in solution and suspension.		
Air.	Liquid.		Organic matter in grains.	Saline matter in grains.	Total matter in solution in grains.	Organic matter in grains.	Earthy matter in grains.	Total matter in suspension in grains.	Organic matter in grains.	Saline and earthy matter in grains.	Grand total in matter grains.
		Lochrin Burn, West of Abattoir or Slaughter-houses.									
Fahr.	Fahr.	Day. Hour.									
46°	48°	14th March 1864 at 2.16 p.m.									
52°	45°	17th " " 1.45 p.m.									
51°	45°	18th " " 11.35 a.m.	11·68	31·20	42·88	28·80	52·00	80·80	40·48	83·20	123·68
50°	44°	19th " " 10.32 a.m.									
50°	45°	21st " " 4.7 p.m.									
48°	45°	22d " " 3.8 p.m.									
47°	46°	23d " " 12.25 p.m.	16·00	24·00	40·00	19·68	13·12	32·80	35·68	37·12	72·80
47°	45°	24th " " 9.40 a.m.	18·60	16·56	35·16	13·88	10·12	24·00	32·48	26·68	59·16
44°	45°	26th " " 10.46 a.m.	8·80	24·48	33·28	28·96	8·32	37·28	37·76	32·80	70·56
44°	44°	28th " " 5.2 p.m.	5·60	22·56	28·16	12·48	6·40	18·88	18·08	28·96	47·04
45°	44°	29th " " 2.10 p.m.	17·28	27·20	44·48	16·80	16·00	32·80	34·08	43·20	77·28
44°	43°	30th " " 7.20 a.m.	6·24	19·20	25·44	16·60	5·28	21·88	22·84	24·48	47·32
49°	47°	31st " " 1.5 p.m.	10·88	25·60	36·48	14·08	9·12	23·20	24·96	34·72	59·68
48°	46°	1st April 1864 " 1.55 p.m.	7·20	25·92	33·12	24·48	18·72	43·20	31·68	44·64	76·32
44°	44°	2d " " 9.45 a.m.	6·72	18·24	24·96	22·88	8·32	31·20	29·60	26·56	56·16
56°	48°	7th " " 9.10 a.m.	21·12	35·20	56·32	89·44	10·72	100·16	110·56	45·92	156·48
69°	57°	20th May 1864 " 12.20 p.m.	18·40	24·00	42·40	135·36	15·04	150·40	153·76	39·04	192·80
64°	54°	25th " " 10.25 a.m.	15·60	28·88	44·48	27·68	10·72	38·40	43·28	39·60	82·88
		Average of 18 samples -	12·36	26·61	38·97	33·06	24·66	57·72	45·42	51·27	96·69

Table B.

Liquids collected from the Drains and Sewers discharging into the Water of Leith.

Temperature.		Place and Time of Collection.	In solution.			In suspension.			One imperial gallon contains in solution and suspension.		
Air.	Liquid.		Organic matter in grains.	Saline matter in grains.	Total matter in solution in grains.	Organic matter in grains.	Earthy matter in grains.	Total matter in suspension in grains.	Organic matter in grains.	Saline and earthy matter in grains.	Grand total in matter grains.
		Lochrin Burn above Caledonian Railway.									
Fahr.	Fahr.	Day. Hour.									
46°	43°	14th March 1864 at 1.56 p.m.									
47°	50°	17th " " 2 p.m.									
47°	53°	18th " " 11.52 a.m.	16·08	31·60	47·68	32·96	9·12	42·08	49·04	40·72	89·76
50°	52°	19th " " 10.50 a.m.									
47°	53°	21st " " 4.30 p.m.									
48°	52°	22d " " 3.30 p.m.									
47°	53°	23d " " 12.48 p.m.	30·68	26·24	56·92	98·48	10·40	108·88	129·16	36·64	165·80
56°	57°	27th April 1864 " 9.25 a.m.	12·00	24·00	36·00	45·16	11·72	56·88	57·16	35·72	92·88
64°	65°	20th May 1864 " 12.40 p.m.	18·80	22·88	41·68	18·08	9·12	27·20	36·88	32·00	68·88
54°	61°	26th " " 9.25 p.m.	18·80	24·32	43·12	16·88	6·64	23·52	35·68	30·96	66·64
53°	57°	27th " " 12.20 a.m.	13·20	23·20	36·40	12·40	4·80	17·20	25·60	28·00	53·60
52°	56°	27th " " 2.30 a.m.	10·84	18·40	29·24	8·20	3·80	12·00	19·04	22·20	41·24
51°	55°	27th " " 4.30 a.m.	8·20	16·32	24·52	5·88	2·72	8·60	14·08	19·04	33·12
60°	59°	27th " " 12.25 p.m.	14·16	29·84	44·00	12·72	6·80	19·52	26·88	36·64	63·52
63°	58°	28th " " 1 p.m.	13·36	25·76	39·12	13·68	6·12	19·80	27·04	31·88	58·92
		Average of 15 samples -	15·77	26·70	42·47	28·61	7·79	36·40	44·38	34·49	78·87
		Dreg running from Caledonian Distillery.									
46°	51°	14th March 1864 at 2.1 p.m.	78·40	25·60	104·00	19·68	2·72	22·40	98·08	28·32	126·40
54°	187°	5th April 1864 " 2.25 p.m.	880·64	193·60	1074·24	242·88	13·92	256·80	1123·52	207·52	1331·04
		Average of 2 samples of dreg	479·52	109·60	589·12	131·28	8·32	139·60	610·80	117·92	728·72
47°	199°	21st March 1864 at 4.35 p.m.	Dreg allowed to settle and sediment dried at 212° yielded - - - -						Organic. 93·32	Saline. 6·68	Total per ct. 100·00

Table C.

Liquids collected from the Drains and Sewers discharging into the Water of Leith.

Temperature.		Place and Time of Collection.	In solution.			In suspension.			One imperial gallon contains in solution and suspension.		
Air.	Liquid.		Organic matter in grains.	Saline matter in grains.	Total matter in solution in grains.	Organic matter in grains.	Earthy matter in grains.	Total matter in suspension in grains.	Organic matter in grains.	Saline and earthy matter in grains.	Grand total in matter in grains.
		Lochrin Burn above Coltbridge.									
Fahr.	Fahr.	Day. Hour.									
45°	44°	14th March 1864 at 1.38 p.m.									
48°	48°	17th " " 2.23 p.m.									
48°	47°	18th " " 12.10 a.m.	23·04	27·20	50·24	39·68	16·32	56·00	62·72	43·52	106·24
50°	44°	19th " " 11.10 a.m.									
47°	45°	21st " " 4.50 p.m.									
48°	43°	22d " " 3.50 p.m.									
50°	51°	23d " " 1.25 p.m.	11·52	23·04	34·56	17·92	8·00	25·92	29·44	31·04	60·48
44°	47°	28th " " 5.20 p.m.	16·24	31·20	47·44	93·68	7·52	101·20	109·92	38·72	148·64
44°	60°	30th " " 7.50 a.m.	174·88	40·64	215·52	15·04	4·00	19·04	189·92	44·64	234·56
48°	51°	1st April 1864 " 2.15 p.m.	33·92	27·04	60·96	27·52	9·12	36·64	61·44	36·16	97·60
44°	48°	2d " " 10.5 a.m.	13·68	21·92	35·60	12·72	8·00	20·72	26·40	29·92	56·32
56°	54°	7th " " 9.35 a.m.	11·52	24·80	36·32	79·84	4·32	84·16	91·36	29·12	120·48
64°	63°	20th May 1864 " 1 p.m.	16·40	25·44	41·84	8·32	8·32	16·64	24·72	33·76	58·48
54°	57°	26th " " 9.35 p.m.	12·16	25·60	37·76	4·00	6·80	10·80	16·16	32·40	48·56
53°	57°	27th " " 12.35 a.m.	11·36	27·20	38·56	3·56	3·64	7·20	14·92	30·84	45·76
52°	60°	27th " " 2.45 a.m.	8·60	19·20	27·80	4·12	3·48	7·60	12·72	22·68	35·40
51°	56°	27th " " 4.40 a.m.	22·40	19·20	41·60	3·60	4·16	7·76	26·00	23·36	49·36
62°	59°	27th " " 1.15 p.m.	12·40	23·04	35·44	6·92	6·16	13·08	19·32	29·20	48·52
63°	59°	28th " " 1.10 p.m.	12·36	20·64	33·00	8·44	6·16	14.60	20·80	26·80	47·60
47°	68°	30th " " 7.10 p.m.	130·56	38·40	168·96	60·80	5·92	66·72	191·36	44·32	235·68
		Average of 20 samples -	31·31	26·53	57·84	29·23	9·17	38·40	60·54	35·70	96·24

Table D.

Liquids collected from the Drains and Sewers discharging into the Water of Leith.

Temperature.		Place and Time of Collection.	In solution.			In suspension.			One imperial gallon contains in solution and suspension.		
Air.	Liquid.		Organic matter in grains.	Saline matter in grains.	Total matter in solution in grains.	Organic matter in grains.	Earthy matter in grains.	Total matter in suspension in grains.	Organic matter in grains.	Saline and earthy matter in grains.	Grand total in matter in grains.
		North Sewer at Stockbridge.									
Fahr.	Fahr.	Day. Hour.									
45°	43°	18th March 1864 at 12.50 p.m.									
50°	46°	19th " " 11.40 a.m.	9·60	23·68	33·28	13·28	9·12	22·40	22·88	32·80	55·68
48°	44°	21st " " 5.15 p.m.									
48°	45°	22d " " 4.30 p.m.									
45°	46°	23d " " 3.35 p.m.	11·68	28·48	40·16	13·28	7·84	21·12	24·96	36·32	61·28
45°	45°	29th " " 1.30 p.m.	8·00	27·84	35·84	20·00	9·92	29·92	28·00	37·76	65·76
44°	43°	30th " " 8.10 a.m.	6·40	18·08	24·48	10·72	4·00	14·72	17·12	22·08	39·20
48°	44°	1st April 1864 " 2.45 p.m.	5·44	24·32	29·76	10·72	11·68	22·40	16·16	36·00	52·16
44°	44°	2d " " 11.35 a.m.	8·88	23·24	32·12	13·20	9·12	22·32	22·08	32·36	54·44
56°	48°	9th " " 4.5 p.m.	4·16	23·68	27·84	11·68	9·12	20·80	15·84	32·80	48·64
		Average of 10 samples -	8·29	24·04	32·33	13·27	8·81	22·08	21·56	32·85	54·41
		South (Moray Place) Sewer at Stockbridge.									
48°	45°	22d March 1864 at 4.35 p.m.	5·08	26·88	31·96	11·88	6·72	18·60	16·96	33·60	50·56
45°	47°	23d " " 3.30 p.m.	6·80	22·24	29·04	15·60	7·52	23·12	22·40	29·76	52·16
45°	45°	29th " " 1.30 p.m.	5·20	24·64	29·84	16·52	10·72	27·24	21·72	35·36	57·08
48°	45°	1st April 1864 " 2.45 p.m.	4·00	23·20	27·20	20·48	7·52	28·00	24·48	30·72	55·20
44°	45°	2d " " 11.44 p.m.	9·44	29·60	39·04	101·60	48·00	149·60	111·04	77·60	188·64
44°	45°	2d " " 11.44 p.m.	9·60	29·60	39·20	80·96	42·72	123·68	90·56	72·32	162·88
64°	54°	25th May 1864 " 10.55 a.m.	10·16	27·44	37·60	12·32	7·52	19·84	22·48	34·96	57·44
54°	54°	26th " " 10.25 p.m.	8·20	17·76	25·96	10·00	7·60	17·60	18·20	25·36	43·56
53°	52°	27th " " 1.30 a.m.	6·52	12·80	19·32	6·80	1·80	8·60	13·32	14·60	27·92
52°	50°	27th " " 3.33 a.m.	5·08	12·80	17·88	4·20	1·60	5·80	9·28	14·40	23·68
51°	50°	27th " " 5.25 a.m.	4·80	14·84	19·64	3·28	0·80	4·08	8·08	15·64	23·72
63°	52°	27th " " 2.3 p.m.	9·92	27·60	37·52	13·04	6·96	20·00	22·96	34·56	57·52
		Average of 12 samples -	7·07	22·45	29·52	24·72	12·45	37·17	31·79	34·90	66·69

Table E.

Liquids collected from the Drains and Sewers discharging into the Water of Leith.

Temperature.		Place and Time of Collection.	In solution.			In suspension.			One imperial gallon contains in solution and suspension.		
Air.	Liquid.		Organic matter in grains.	Saline matter in grains.	Total matter in solution in grains.	Organic matter in grains.	Earthy matter in grains.	Total matter in suspension in grains.	Organic matter in grains.	Saline and Earthy matter in grains.	Grand total in grains.
		Canonmills Sewer.									
Fahr.	Fahr.	Day. Hour.									
46°	44°	14th March 1864 at 12.59 p.m.									
50°	45°	17th " " 2.55 p.m.									
50°	45°	18th " " 1.3 p.m.	8·60	23·20	31·80	16·80	13·60	30·40	25·40	36·80	62·20
50°	44°	19th " " 11.54 a.m.									
48°	45°	21st " " 5.27 p.m.									
48°	45°	22d " " 4.54 p.m.									
45°	46°	23d " " 3.50 p.m.	8·96	57·76	66·72	47·68	49·92	97·60	56·64	107·68	164·32
46°	46°	26th " " 11.32 a.m.	7·68	24·48	32·16	28·32	8·48	36·80	36·00	32·96	68·96
44°	45°	28th " " 5.40 p.m.	7·06	23·52	30·58	9·28	5·12	14·40	16·34	28·64	44·98
45°	45°	29th " " 1.22 p.m.	8·00	28·80	36·80	20·80	10·72	31·52	28·80	39·52	68·32
44°	44°	30th " " 8.18 a.m.	6·08	18·40	24·48	14·40	15·20	29·60	20·48	33·60	54·08
49°	46°	31st " " 2.20 p.m.	23·84	24·96	48·80	6·08	8·32	14·40	29·92	33·28	63·20
48°	46°	1st April 1864 " 2.55 p.m.	8·00	27·20	35·20	8·08	9·92	18·00	16·08	37·12	53·20
44°	45°	2d " " 12 noon.	4·00	15·20	19·20	18·72	11·52	30·24	22·72	26·72	49·44
62°	55°	25th May 1864 " 5.20 p.m.	9·52	23·20	32·72	9·12	7·52	16·64	18·64	30·72	49·36
54°	53°	26th " " 10.35 p.m.	8·00	23·20	31·20	8·40	2·40	10·80	16·40	25·60	42·00
53°	51°	27th " " 1.45 a.m.	5·24	18·36	23·60	4·28	0·80	5·08	9·52	19·16	28·68
52°	50°	27th " " 3.38 a.m.	4·20	15·80	20·00	1·92	0·48	2·40	6·12	16·28	22·40
51°	50°	27th " " 5.40 a.m.	3·60	18·40	22·00	2·72	0·48	3·20	6·32	18·88	26·20
56°	50°	27th " " 2.18 p.m.	8·60	25·92	34·52	10·64	8·16	18·80	19·24	34·08	53·32
59°	51°	28th " " 5.25 p.m.	7·76	21·44	29·20	34·88	9·92	44·80	42·64	31·36	74·00
		Average of 21 samples -	8·20	24·10	32·30	15·50	11·00	26·50	23·70	35·10	58·80

Table F.

Liquids collected from the Drains and Sewers discharging into the Water of Leith.

Temperature.		Place and Time of Collection.	In solution.			In suspension.			One imperial gallon contains in solution and suspension.		
Air.	Liquid.		Organic matter in grains.	Saline matter in grains.	Total matter in solution in grains.	Organic matter in grains.	Earthy matter in grains.	Total matter in suspension in grains.	Organic matter in grains.	Saline and earthy matter in grains.	Grand total matter in grains.
		Broughton Burn Sewer at Bonnington Road, and immediately above junction with Water of Leith.									
Fahr.	Fahr.	Day. Hour.									
65°	57°	9th April 1864 at 11.50 a.m.	9·12	22·24	31·36	14·40	10·88	25·28	23·52	33·12	56·64
64°	61°	25th May 1864 " 3.20 p.m.	12·00	28·80	40·80	60·48	23·52	84·00	72·48	52·32	124·80
		Average of 2 samples -	10·56	25·52	36·08	37·44	17·20	54·64	48·00	42·72	90·72
		Bulls Stank Sewer at Lovers Loan.									
47°	45°	21st March 1864 at 6.5 p.m.	5·44	31·04	36·48	14·08	5·92	20·00	19·52	36·96	56·48
		Bulls Stank Sewer at Junction Road Bridge, Leith.									
45°	42°	14th March 1864 at 12.37 p.m.									
49°	45°	17th " " 4.8 p.m.	5·28	31·04	36·32	10·88	5·92	16·80	16·16	36·96	53·12
36°	40°	19th " " 8.5 a.m.									
64°	57°	25th May 1864 " 1.1 p.m.	8·32	32·96	41·28	7·68	2·72	10·40	16·00	35·68	51·68
		Average of 5 samples -	5·92	31·42	37·34	10·88	5·28	16·16	16·80	36·70	53·50
		Coal Hill Sewer at Leith.									
45°	43°	18th March 1864 at 5.7 p.m.									
36°	49°	19th " " 7.50 a.m.	64·64	145·76	210·40	80·48	36·32	116·80	145·12	182·08	327·20
36°	41°	19th " " 7.55 a.m.									
		Sewer below Drawbridge at Leith.									
44°	46°	23d March 1864 at 6.50 p.m.	7·84	46·56	54·40	10·40	4·80	15·20	18·24	51·36	69·60

Table G.

Sedimentary Matters collected from the bottom of the open Sewers discharging into the Water of Leith.

Dried at 212° Fahr.

Temperature.		Place and time of collection.	Per-centage composition.			
Air.	Sediment.		Organic matter.	Earthy matter.	Total.	Nitrogen.
Fahr.	Fahr.					Average Amount.
51°	45°	Edinburgh Sewers, Lochrin Burn, west of Slaughter-houses, collected on 18th March 1864 at 11.35 a.m.	44·92	55·08	100·00	
50°	44°	Edinburgh Sewers, Lochrin Burn, west of Slaughter-houses, collected on 19th March 1864 at 10.35 a.m.	46·12	53·88	100·00	
50°	45°	Edinburgh Sewers, Lochrin Burn, west of Slaughter-houses, collected on 21st March 1864 at 4.10 p.m.	67·72	32·28	100·00	1·30
48°	45°	Edinburgh Sewers, Lochrin Burn, west of Slaughter-houses, collected on 22d March 1864 at 3.12 p.m.	52·44	47·56	100·00	
47°	46°	Edinburgh Sewers, Lochrin Burn, west of Slaughter-houses, collected on 23d March 1864 at 12.30 p.m.	55·32	44·68	100·00	
69°	57°	Edinburgh Sewers, Lochrin Burn, west of Slaughter-houses, collected on 20th May 1864 at 12.20 p.m.	46·12	53·88	100·00	
64°	54°	Edinburgh Sewers, Lochrin Burn, west of Slaughter-houses, collected on 25th May 1864 at 10.25 a.m.	35·32	64·68	100·00	1·20
		Average of 7 samples	49·70	50·30	100·00	1·27
48°	52°	Edinburgh Sewers, Lochrin Burn above Caledonian Distillery, collected on 22d March 1864 at 3.35 p.m.	26·12	73·88	100·00	
47	53°	Edinburgh Sewers, Lochrin Burn, above Caledonian Distillery, collected on 23d March 1864 at 1 p.m.	36·44	63·56	100·00	0·57
64	65°	Edinburgh Sewers, Lochrin Burn, above Caledonian Distillery, collected on 20th May 1864 at 12.40 p.m.	20·52	79·48	100·00	0·42
		Average of 3 samples	27·70	72·30	100·00	0·52
50	44°	Edinburgh Sewers, Lochrin Burn, above Coltbridge, collected on 19th March 1864 at 11.12 a.m.	14·52	85·48	100·00	
48°	43°	Edinburgh Sewers, Lochrin Burn, above Coltbridge, collected on 22d March 1864 at 3.55 p.m.	17·20	82·80	100·00	0·77
64°	63°	Edinburgh Sewers, Lochrin Burn, above Coltbridge, collected on 20th May 1864 at 1 p.m.	19·32	80·68	100·00	0·58
		Average of 3 samples	17·02	82·98	100·00	0·71
47	45°	Edinburgh Sewers, Bulls Stank at Lovers Loan, collected on 21st March 1864 at 6.10 p.m.	50·72	49·28	100·00	0·76
65°	57°	Edinburgh Sewers, Broughton Burn, at Bonnington Road, collected on 9th April 1864 at 12 noon	20·52	79·48	100·00	0·82

Table H.

Liquids collected from the Water of Leith above Coltbridge.

Temperature.		Place and Time of Collection.	In solution.			In suspension.			One imperial gallon contains in solution and suspension.		
Air.	Liquid.		Organic matter in grains.	Saline matter in grains.	Total matter in solution in grains.	Organic matter in grains.	Earthy matter in grains.	Total matter in suspension in grains.	Organic matter in grains.	Saline and earthy matter in grains.	Grand total matter in grains.
Fahr.	Fahr.										
44°	35°	Harelaw Reservoir on 24th March 1864 at 11.4 a.m.	2·32	3·88	6·20	0·24	2·72	2·96	2·56	6·60	9·16
44°	35°	Bavelaw Burn above Works, on 24th March 1864 at 11.22 a.m.	2·60	4·60	7·20	1·16	1·72	2·88	3·76	6·32	10·08
46°	41°	Bavelaw Burn, below Hill's Mill, on 24th March 1864 at 12.30 p.m.	2·60	5·60	8·20	1·83	1·12	2·95	4·43	6·72	11·15
47°	41°	Water of Leith above Balerno Bridge, on 24th March 1864 at 12.35 p.m.	1·64	8·80	10·44	0·36	2·72	3·08	2·00	11·52	13·52
47°	41°	Water of Leith above Kinleith Mill, on 24th March 1864 at 1.10 p.m.	3·36	7·04	10·40	0·96	2·02	2·98	4·32	9·06	13·38
47°	41°	Water of Leith below Kinleith Mill, on 24th March 1864 at 1.45 p.m.	4·32	8·08	12·40	1·12	3·36	4·48	5·44	11·44	16·88
47°	41°	Water of Leith above Katesmill, on 24th March 1864 at 2.30 p.m.	4·00	9·60	13·60	1·76	4·80	6·56	5·76	14·40	20·16
47°	41°	Water of Leith below Katesmill, on 24th March 1864 at 2.45 p.m.	7·20	16·80	24·00	1·28	2·64	3·92	8·48	19·44	27·92
47°	41°	Water of Leith below Katesmill, on 24th March 1864 at 2.45 p.m.	8·00	17·92	25·92	1·33	2·72	4·05	9·33	20·64	29·97
47°	42°	Water of Leith at Gorgie Dam, on 24th March 1864 at 3.40 p.m.	4·36	10·40	14·76	2·84	3·52	6·36	7·20	13·92	21·12
61°	52°	Water of Leith at Gorgie Dam, on 27th May 1864 at 12.45 p.m.	3·76	13·28	17·04	0·76	0·51	1·27	4·52	13·79	18·31
		Water of Leith immediately above Coltbridge.									
48°	42°	17th March 1864 at 2.18 p.m.									
47°	47°	18th " " 12.20 p.m.									
50°	42°	19th " " 11.20 a.m.	3·70	11·36	15·06	2·56	3·52	6·08	6·26	14·88	21·14
47°	41°	21st " " 4.57 p.m.									
48°	43°	22d " " 4.1 p.m.									
50°	43°	23d " " 1.35 p.m.	2·68	12·32	15·00	2·64	3·04	5·68	5·32	15·36	20·68
50°	43°	23d " " 1.40 p.m.	2·56	12·48	15·04	2·12	3·04	5·16	4·08	15·52	20·20
47°	41°	24th " " 4.0 p.m.	3·96	9·60	13·56	2·40	3·52	5·92	6·36	13·12	19·48
44°	41°	26th " " 11.10 a.m.	3·96	13·76	17·72	1·28	3·52	4·80	5·24	17·28	22·52
44°	41°	28th " " 5.15 p.m.	3·00	12·20	15·20	2·88	2·72	5·60	5·88	14·92	20·80
45°	42°	29th " " 1.55 p.m.	3·68	14·40	18·08	1·28	2·72	4·00	4·96	17·12	22·08
44°	41°	30th " " 7.45 a.m.	3·36	11·66	15·02	1·60	3·20	4·80	4·96	14·86	19·82
49°	43°	31st " " 1.55 p.m.	3·20	11·36	14·56	0·48	1·12	1·60	3·68	12·48	16·16
48°	43°	1st April 1864 " 2.22 p.m.	2·24	13·12	15·36	0·80	2·72	3·52	3·04	15·84	18·88
44°	40°	2nd " " 10.10 a.m.	1·80	10·08	11·88	2·20	3·20	5·40	4·00	13·28	17·28
56°	54°	7th " " 1.45 p.m.	3·32	16·00	19·32	2·00	3·00	5·00	5·32	19·00	24·32
64°	60°	20th May 1864 " 1.10 p.m.	3·60	15·60	19·20	1·28	1·12	2·40	4·88	16·72	21·60
62°	58°	25th " " 6.45 p.m.	3·40	16·64	20·04	0·98	0·36	1·34	4·38	17·00	21·38
54°	57°	26th " " 9.40 p.m	3·80	14·24	18·04	1·60	0·80	2·40	5·40	15·04	20·44
59°	55°	27th " " 12·40 a.m.	2·56	12·80	15·36	1·28	0·32	1·60	3·84	13·12	16·96
52°	56°	27th " " 2.50 a.m.	3·84	13·60	17·44	0·96	0·32	1·28	4·80	13·92	18·72
51°	54°	27th " " 4.49 a.m.	4·16	15·04	19·20	0·48	0·32	0·80	4·64	15·36	20·00
62°	53°	27th " " 1.0 p.m.	3·28	16·32	19·60	0·80	0·80	1·60	4·08	17·12	21·20
		Average of 23 samples	3·34	12·96	16·30	1·73	2·32	4·05	5·07	15·28	20·35

Table I.

Liquids collected from the Water of Leith from Coltbridge down to dam below Water of Leith Village.

Temperature.		Place and Time of Collection.	In solution.			In suspension.			One imperial gallon contains in solution and suspension.		
Air.	Liquid.		Organic matter in grains.	Saline matter in grains.	Total matter in solution in grains.	Organic matter in grains.	Saline matter in grains.	Total matter in suspension in grains.	Organic matter in grains.	Saline and earthy matter in grains.	Grand total in matter in grains.
		Water of Leith at dam below Coltbridge.									
Fahr.	Fahr.	Day. Hour.									
62°	58°	25th May 1864 at 7.0 p.m.	6·40	16·80	23·20	2·96	1·32	4·28	9·36	18·12	27·48
		Water of Leith at dam above Water of Leith village.									
50°	43°	23d March 1864 at 2 35 p.m.	4·32	12·48	16·80	4·64	2·88	7·52	8·96	15·36	24·32
56°	54°	7th April 1864 „ 2.20 p.m.	4·88	11·20	16·08	6·54	3·20	9·74	11·42	14·40	25·82
		Average of 2 samples -	4·60	11·84	16·44	5·59	3·04	8·63	10·19	14·88	25·07
		Water of Leith at dam below Water of Leith village.									
44°	42°	2d April 1864 at 10.30 a.m.	4·64	14·56	19·20	14·40	4·32	18·72	19·04	18·88	37·92
56°	54°	7th „ „ 2.10 p.m.	4·48	11·20	15·68	4·00	1·12	5·12	8·48	12·32	20·80
64°	61°	20th May 1864 „ 1.52 p.m.	6·40	15·20	21·60	3·20	2·24	5·44	9·60	17·44	27·04
54°	56°	26th „ „ 9.55 p.m.	6·08	17·60	23·68	2·40	0·48	2·88	8·48	18·08	26·56
53°	55°	27th „ „ 1.0 a.m.	4·64	15·52	20·16	3·68	1·12	4·80	8·32	16·64	24·96
52°	54°	27th „ „ 3.5 a.m.	5·60	13·60	19·20	2·08	0·80	2·88	7·68	14·40	22·08
51°	54°	27th „ „ 5.5 a.m.	5·40	15·36	20·76	1·64	0·38	2·02	7·04	15·74	22·78
64°	53°	27th „ „ 1.35 p.m.	5·68	16·40	22·08	2·80	0·60	3·40	8·48	17·00	25·48
		Average of 8 samples -	5·36	14·93	20·29	4·27	1·38	5·65	9·63	16·31	25·94

Table K.

Liquids collected from the Water of Leith from the dam below Water of Leith Village (where Edinburgh Lade begins) to St. Mark's Place (where Edinburgh Lade again joins the stream).

Temperature.		Place and Time of Collection.	In solution.			In suspension.			One imperial gallon contains in solution and suspension.		
Air.	Liquid.		Organic matter in grains.	Saline matter in grains.	Total matter in solution in grains.	Organic matter in grains.	Earthy matter in grains.	Total matter in suspension in grains.	Organic matter in grains.	Saline and earthy matter in grains.	Grand total in matter in grains.
		Water of Leith under Dean Bridge.									
Fahr.	Fahr.	Day. Hour.									
62°	58°	25th May 1864 at 6.25 p.m.	14·40	14·24	28·64	3·08	1·12	4·20	17·48	15·36	32·84
54°	56°	26th „ „ 10.0 p.m.	7·52	14·56	22·08	2·96	0·64	3·60	10·48	15·20	25·68
53°	55°	27th „ „ 1.5 a.m.	5·20	19·20	24·40	2·40	0·80	3·20	7·60	20·00	27·60
52°	54°	27th „ „ 3.10 a.m.	5·36	15·60	20·96	2·96	0·64	3·60	8·32	16·24	24·56
51°	54°	27th „ „ 5.10 a.m.	4·80	14·80	19·60	2·36	0·46	2·82	7·16	15·26	22·42
64°	53°	27th „ „ 1.40 p.m.	7·08	16·00	23·08	2·80	0·50	3·30	9·88	16·50	26·38
		Average of 6 samples -	7·39	15·73	23·12	2·76	0·69	3·45	10·15	16·42	26·57

Table K.—*continued.*

Liquids collected from the Water of Leith from the dam below Water of Leith Village (where Edinburgh Lade begins) to St. Mark's Place (where Edinburgh Lade again joins the stream).

Temperature.		Place and Time of Collection.	In solution.			In suspension.			One imperial gallon contains in solution and suspension.		
Air.	Liquid.		Organic matter in grains.	Saline matter in grains.	Total matter in solution in grains.	Organic matter in grains.	Earthy matter in grains.	Total matter in suspension in grains.	Organic matter in grains.	Saline and earthy matter in grains.	Grand total in matter grains.
		Water of Leith behind Moray Place, near St. Bernard's Well.									
Fahr.	Fahr.	Day. Hour.									
62°	58°	25th May 1864 at 6.10 p.m.	11·68	18·40	30·08	3·43	0·82	4·30	15·16	19·22	34·38
54°	56°	26th „ „ 10.10 p.m.	7·60	15·20	22·80	2·86	0·64	3·50	10·46	15·84	26·30
53°	55°	27th „ „ 1.20 a.m.	6·40	19·20	25·60	2·76	0·64	3·40	9·16	19·84	29·00
52°	54°	27th „ „ 3.20 a.m.	5·48	16·80	22·28	2·12	0·48	2·60	7·60	17·28	24·88
51°	54°	27th „ „ 5.10 a.m.	3·52	14·40	17·92	1·96	0·56	2·52	5·48	14·96	20·44
64°	53°	27th „ „ 1.50 p.m.	6·48	11·52	18·00	3·32	1·06	4·38	9·80	12·58	22·38
		Average of 6 samples -	6·86	15·08	21·94	2·75	0·70	3·45	9·61	15·78	25·39
		Water of Leith immediately above Stockbridge.									
64°	58°	25th May 1864 at 10.55 a.m.	13·60	16·80	30·40	3·12	0·60	3·72	16·72	17·40	34·12
54°	55°	26th „ „ 10.27 p.m.	6·40	14·40	20·80	2·80	0·76	3·56	9·20	15·16	24·36
53°	55°	27th „ „ 1.34 a.m.	6·00	18·56	24·56	2·92	0·48	3·40	8·92	19·04	27·96
52°	54°	27th „ „ 3.30 a.m.	5·80	17·60	23·40	1·96	0·64	2·60	7·76	18·24	26·00
51°	54°	27th „ „ 5.28 a.m.	6·40	14·40	20·80	1·84	0·42	2·26	8·24	14·82	23·06
63°	52°	27th „ „ 2.6 p.m.	6·00	15·20	21·20	2·64	0·60	3·24	8·64	15·80	24·44
		Average of 6 samples -	7·36	16·16	23·52	2·55	0·58	3·13	9·91	16·74	26·65
		Water of Leith 30 yards below Stockbridge.									
64°	56°	25th May 1864 at 10.45 a.m.	13·76	14·40	28·16	41·12	5·72	46·84	54·88	20·12	75·00
64°	56°	25th „ „ 10.45 a.m.	16·00	16·00	32·00	32·88	4·92	37·80	48·88	20·92	69·80
62°	55°	25th „ „ 5.40 p.m.	10·40	20·96	31·36	11·44	1·12	12·56	21·84	22·08	43·92
54°	53°	26th „ „ 10.30 p.m.	6·76	15·36	22·12	4·48	3·24	7·72	11·24	18·60	29·84
53°	54°	27th „ „ 1.36 a.m.	7·20	14·12	21·32	4·64	1·16	5·80	11·84	15·28	27·12
52°	53°	27th „ „ 3.33 a.m.	5·44	14·80	20·24	4·80	0·83	5·63	10·24	15·63	25·87
51°	53°	27th „ „ 5.30 a.m.	5·00	13·28	18·28	3·28	2·32	5·60	8·28	15·60	23·88
63°	52°	27th „ „ 2.8 p.m.	6·96	13·60	20·56	12·64	1·32	13·96	19·60	14·92	34·52
59°	52°	28th „ „ 5.45 p.m.	8·80	16·00	24·80	12·88	1·92	14·80	21·68	17·92	39·60
		Average of 9 samples -	8·92	15·40	24·32	14·24	2·50	16·74	23·16	17·90	41·06
		Water of Leith behind Warriston Crescent.									
62°	60½	25th May 1864 at 5.10 p.m.	7·04	25·60	32·64	10·08	3·52	14·20	17·72	29·12	46·84

Table L.

Liquids collected from the Edinburgh Lade flowing from the Dam below Water of Leith Village to St. Mark's Place.

Temperature.		Place and Time of Collection.	In solution.			In suspension.			One imperial gallon contains in solution and suspension.		
Air.	Liquid.		Organic matter in grains.	Saline matter in grains.	Total matter in solution in grains.	Organic matter in grains.	Earthy matter in grains.	Total matter in suspension in grains.	Organic matter in grains.	Saline and earthy matter in grains.	Grand total matter in grains.
Fahr.	Fahr.	Water of Leith Lade behind India Place. Day. Hour.									
64°	61°	20th May 1864 at 2.30 p.m.	7·36	15·44	22·80	3·68	2·52	6·20	11·04	17·96	29·00
54°	56°	26th „ „ 10.12 p.m.	7·20	16·20	23·40	2·44	0·96	3·40	9·64	17·16	26·80
53°	55°	27th „ „ 1.25 a.m.	4·80	15·80	20·60	2·72	0·48	3·20	7·52	16·28	23·80
52°	54°	27th „ „ 3.25 a.m.	4·96	20·00	24·96	2·28	0·32	2·60	7·24	20·32	27·56
51°	54°	27th „ „ 5.22 a.m.	5·60	18·80	24·40	2·56	0·64	3·20	8·16	19·44	27·60
63°	53°	27th „ „ 1.55 p.m.	6·40	16·60	23·00	3·36	1·44	4·80	9·76	18·04	27·80
		Average of 6 samples -	6·05	17·14	23·19	2·84	1·06	3·90	8·89	18·20	27·09
		Water of Leith Lade below Beaver Hall.									
64°	60°	25th May 1864 at 4.35 p.m.	12·00	18·40	30·40	3·64	1·92	5·56	15·64	20·32	35·96
54°	51°	27th „ „ 2.35 p.m.	8·40	16·16	24·56	8·40	0·80	9·20	16·80	16·96	33·76
		Average of 2 samples -	10·20	17·28	27·48	6·02	1·36	7·38	16·22	18·64	34·86

Table M.

Liquids collected from the Water of Leith at St. Mark's Place after junction with the Edinburgh Lade.

Temperature.		Place and Time of Collection.	In solution.			In suspension.			One imperial gallon contains in solution and suspension.		
Air.	Liquid.		Organic matter in grains.	Saline matter in grains.	Total matter in solution in grains.	Organic matter in grains.	Earthy matter in grains.	Total matter in suspension in grains.	Organic matter in grains.	Saline and earthy matter in grains.	Grand total matter in grains.
Fahr.	Fahr.	St. Mark's Place below junction of Lade. Day. Hour.									
50°	43°	17th March 1864 at 3.3 p.m.	3·52	9·76	13·28	5·28	3·52	8·80	8·80	13·28	22·08
48°	44°	22d „ „ 5.2 p.m.									
48°	44°	22d „ „ 5.12 p.m.	3·20	15·52	18·72	4·80	8·00	12·80	8·00	23·52	31·52
44°	44°	23d „ „ 4.5 p.m.	7·20	14·72	21·92	6·88	5·12	12·00	14·08	19·84	33·92
46°	45°	26th „ „ 11.40 a.m.	7·52	14·72	22·24	11·68	5·12	16·80	19·20	19·84	39·04
44°	42°	28th „ „ 5.50 p.m.	6·72	11·52	18·24	5·28	5·92	11·20	12·00	17·44	29·44
45°	43°	29th „ „ 1.15 p.m.	9·76	16·00	25·76	14·40	5·92	20·32	24·16	21·92	46·08
44°	42°	30th „ „ 8.25 a.m.	9·60	14·56	24·16	3·12	2·00	5·12	12·72	16·56	29·28
49°	46°	31st „ „ 2.30 p.m.	6·40	10·40	16·80	4·16	5·12	9·28	10·56	15·52	26·08
48°	46°	1st April 1864 „ 3 p.m.	11·60	16·96	28·56	41·48	14·72	56·20	53·08	31·68	84·76
44°	43°	2d „ „ 12.8 p.m.	9·36	14·72	24·08	23·28	29·92	53·20	32·64	44·64	77·28
64°	62°	20th May 1864 „ 2.55 p.m.	8·80	16·06	24·86	26·88	29·12	56·00	35·68	45·12	80·80
64°	60°	25th „ „ 4.45 p.m.	21·44	18·00	39·44	143·36	145·12	288·48	164·80	163·12	327·92
54°	53°	26th „ „ 10.40 p.m.	6·68	19·20	25·88	4·92	2·48	7·40	11·60	21·68	33·28
53°	54°	27th „ „ 1.49 a.m.	6·00	16·80	22·80	4·76	2·32	7·08	10·76	19·12	29·88
52°	53°	27th „ „ 3.45 a.m.	7·60	16·80	24·40	3·20	1·80	5·00	10·80	18·60	29·40
51°	53°	27th „ „ 5.50 a.m.	6·40	13·30	20·00	5·44	1·96	7·40	11·84	15·56	27·40
62°	52°	27th „ „ 2.30 p.m.	8·32	15·20	23·52	18·24	3·16	21·40	26·56	18·36	44·92
		Average of 18 samples -	7·98	14·68	22·66	18·47	15·27	33·73	26·45	29·95	56·39

TABLE N.

Liquids collected from the Water of Leith from St. Mark's Place down to the Harbour of Leith.

Temperature.		Place and Time of Collection.	In solution.			In suspension.			One imperial gallon contains in solution and suspension.		
Air.	Liquid.		Organic matter in grains.	Saline matter in grains.	Total matter in solution grains.	Organic matter in grains.	Earthy matter in grains.	Total matter in suspension in grains.	Organic matter in grains.	Saline and earthy matter in grains.	Grand total matter in grains.
Fahr.	Fahr.	Water of Leith from Dam above Bonnington. Day. Hour.									
64°	61°	25th May 1864 at 4.15 p.m.	12·80	17·80	30·60	115·68	153·12	268·80	128·48	170·92	299·40
		Water of Leith at Boundary of Edinburgh and Leith at Bonnington Bridge.									
64°	62°	25th May 1864 at 3.45 p.m.	10·24	17·60	27·84	30·88	33·12	64·00	41·12	50·72	91·84
		Water of Leith from Dam above Junction Road Bridge.									
64°	61°	25th May 1864 at 3 p.m.	16·96	21·92	38·88	500·96	369·12	870·08	517·92	391·04	908·96
		Water of Leith above Saw-mills.									
36°	40°	19th March 1864 at 8.22 a.m.	4·32	10·08	14·40	5·20	3·52	8·72	9·52	13·60	23·12
		Water of Leith below Junction Road Bridge and off Bulls Stank Sewer.									
49°	44°	17th March 1864 at 4.10 p.m.	4·32	12·32	16·64	3·36	4·64	8·00	7·68	16·96	24·64
64°	61°	25th May 1864 „ 1 p.m.	14·04	24·32	38·36	4·08	1·92	6·00	18·12	26·24	44·36
		Average of 2 samples -	9·18	18·32	27·50	3·72	3·28	7·00	12·90	21·60	34·50
		Water of Leith above Coal Hill.									
45°	43°	18th March 1864 at 5.13 p.m.	8·64	76·00	84·64	10·88	5·92	16·80	19·52	81·92	101·44
46°	43°	21st „ „ 5.45 p.m.									
45°	44°	29th „ „ 12.55 p.m.	9·76	44·80	54·56	21·12	5·92	27·04	30·88	50·72	81·60
		Average of 3 samples -	9·01	65·60	74·61	14·29	5·92	20·21	23·30	71·52	94·82
		Water of Leith from off Coal Hill Sewer.									
42°	42°	23d March 1864 at 6.35 p.m.	35·20	170·08	205·28	8·32	6·72	15·04	43·52	176·80	220·32
		Water of Leith from harbour at Upper Drawbridge.									
54°	56°	26th May 1864 at 11 p.m.	27·36	157·76	185·12	4·16	3·84	8·00	31·52	161·60	193·12
		Water of Leith below Upper Drawbridge.									
42°	42°	25th March 1864 at 6.45 p.m.	31·84	609·60	641·44	10·72	10·40	21·12	42·56	620·00	662·56
		Water of Leith in harbour off Victoria Dock Head.									
64°	52°	25th May 1864 at 12.20 p.m. Low Water.	3·92	1208·80	1212·72	1·32	1·12	2·44	5·24	1209·92	1215·16

Table O.

Sedimentary Matters collected from the Bed of the Water of Leith, and from the Bottom of the Edinburgh Lade.

Dried at 212° Fahr.

Temperature.		Place and Time of Collection.	Per-centage composition.			
Air.	Sediment.		Organic matter.	Earthy matter.	Total.	Nitrogen.
Fahr.	Fahr.	Bed of Water of Leith.				
50°	43°	Underneath dam below Water of Leith Village, collected on 23d March 1864 at 2.10 p.m.	82·12	17·88	100·00	2·04
44°	42°	From dam below Water of Leith Village, collected on 2d April 1864 at 10.40 a.m.	35·32	64·68	100·00	
64°	61°	From dam below Water of Leith Village, collected on 20th May 1864 at 1.32 p.m.	35·72	64·28	100·00	1·12
64°	61°	Below Dean Bridge, collected on 20th May 1864 at 1.40 p.m.	39·32	60·68	100·00	1·31
		Average of 4 samples	48·12	51·88	100·00	1·63
44°	42°	Behind Ainslie and Moray Place, collected on 2d April 1864 at 11.25 a.m.	49·72	50·28	100·00	0·98
64°	61°	Behind Ainslie and Moray Place, collected on 20th May 1864 at 2 p.m.	40·12	59·88	100·00	
		Average of 2 samples	44·92	55·08	100·00	0·98
45°	43°	Sediment lying in bed of Water of Leith, 4 to 6 yards below North Sewer at Stockbridge, collected on 18th March 1864 at 12.55 p.m.	41·52	58·48	100·00	1·14
50°	46°	Sediment lying in bed of Water of Leith, 4 to 6 yards below North Sewer at Stockbridge, collected on 19th March at 11.40 a.m.	23·92	76·08	100·00	
48°	44°	Sediment lying in bed of Water of Leith, 4 to 6 yards below North Sewer at Stockbridge, collected on 21st March 1864 at 5.20 p.m.	48·32	51·68	100·00	
48°	45°	Sediment lying in bed of Water of Leith, 4 to 6 yards below North Sewer at Stockbridge, collected on 22d March 1864 at 4.35 p.m.	66·52	33·48	100·00	
48°	45°	Sediment lying in bed of Water of Leith, below South Sewer at Stockbridge, collected on 22d March 1864 at 4.45 p.m.	37·12	62·88	100·00	
45°	46°	Sediment lying in bed of Water of Leith, below North and South Sewers at Stockbridge, collected on 23d March 1864 at 3.35 p.m.	28·56	71·44	100·00	
48	44°	Sediment lying in bed of Water of Leith below North and South Sewers at Stockbridge, collected on 1st April 1864 at 2.45 p.m.	54·56	45·44	100·00	
44°	45°	Sediment lying in bed of Water of Leith below North and South Sewers at Stockbridge, collected on 2d April 1864 at 11.45 a.m.	48·80	51·20	100·00	
		Average of 8 samples	43·67	56·33	100·00	1·14
64°	61°	Sides of narrowed channel of Water of Leith at Stockbridge below sewers, collected on 20th May 1864 at 2.40 p.m.	34·52	65·48	100·00	0·50
62°	59°	Eighty yards below Stockbridge, collected on 25th May 1864 at 2.55 p.m.	25·12	74·88	100·00	1·08
62°	59°	Behind Malta Terrace, collected on 25th May 1864 at 5.30 p.m.	32·52	67·48	100·00	

Table O.—*continued.*

Sedimentary Matters collected from the Bed of the Water of Leith, and from the Bottom of the Edinburgh Lade.

Dried at 212° Fahr.

Temperature.		Place and Time of Collection.	Per-centage composition.			
Air.	Sediment.		Organic matter.	Earthy matter.	Total.	Nitrogen.
Fahr.	Fahr.	Bed of Water of Leith—*cont.*				
50°	45°	Sediment in bed of Water of Leith in front of sewer at Canonmills, collected on 18th March 1864 at 1.5 p.m.	31·72	68·28	100·00	0·57
62°	60°	Behind Warriston Crescent, collected on 25th May 1864 at 5.10 p.m.	13·32	86·68	100·00	0·55
48°	44°	At St. Mark's Place, collected on 22d March 1864 at 5.12 p.m.	40·72	59·28	100·00	
44°	44°	At St. Mark's Place, collected on 23d March 1864 at 4.5 p.m.	41·24	58·76	100·00	
44°	43°	At St. Mark's Place, collected on 2d April 1864 at 12.10 p.m.	24·40	75·60	100·00	1·14
62°	50°	At St. Mark's Place, collected on 9th April 1864 at 3.45 p.m.	40·52	59·48	100·00	
64°	62°	At St. Mark's Place, collected on 26th May 1864 at 2.55 p.m.	40·52	59·48	100·00	
62°	60°	At St. Mark's Place, collected on 25th May 1864 at 4.50 p.m.	30·92	69·08	100·00	
54°	53°	At St. Mark's Place, collected on 27th May 1864 at 5.55 p.m.	44·70	55·30	100·00	1·08
62°	60°	At St. Mark's Place, collected on 25th May 1864 (green matter) at 5 p.m.	48·12	51·88	100·00	
		Average of 9 samples	36·05	63·95	100·00	1·05
64°	61°	At dam above Bonnington, collected on 25th May 1864 at 4.15 p.m.	40·72	59·28	100·00	1·40
64°	62°	At Boundary of Edinburgh and Leith at Bonnington Bridge, collected on 25th May 1864 at 3.45 p.m.	26·92	73·08	100·00	0·70
64°	61°	Immediately below the junction of the Broughton Burn, collected on 9th April 1864 at 12.5 p.m.	13·72	86·28	100·00	0·52
64°	61°	Dam above Junction Road Bridge, collected on 25th May 1864 at 3.5 p.m.	27·72	72·28	100·00	0·70
		Water of Leith Lade which traverses Edinburgh.				
44°	42°	Mud taken from lade behind Ainslie Place, collected on 2d April 1864 at 10.45 a.m.	12·52	87·48	100·00	0·34
44°	42°	Mud taken from lade behind Moray Place, collected on 2d April 1864 at 11.0 a.m.	21·48	78·52	100·00	0·62
64°	61°	Mud taken from lade behind Moray and Ainslie Places, collected on 20th May 1864 at 2.10 p.m.	11·32	88·68	100·00	0·46
50°	43°	Mud taken from lade behind India Place, collected on 23d March 1864 at 3.20 p.m.	21·12	78·88	100·00	0·59
56°	42°	Mud taken from lade behind India Place, collected on 7th April 1864 at 3.15 p.m.	37·00	63·00	100·00	0·84
64°	61°	Mud taken from lade behind India Place, collected on 20th May 1864 at 2.25 p.m.	20·92	79·08	100·00	0·62
44°	42°	Mud taken from lade above Canonmills, collected on 2d April 1864 at 12.3 p.m.	55·52	44·48	100·00	1·34
		Average of 7 samples	25·70	74·30	100·00	0·69

Table P.

Sedimentary Matters collected from the bed of the Harbour of Leith.

Dried at 212° Fahrenheit.

Temperature.		Place and Time of Collection.	Per-centage composition.			
Air.	Sediment.		Organic matter.	Earthy matter.	Total.	Nitrogen.
Fahr. 36°	Fahr. 41°	South-east side of harbour of Leith, bank below Junction Road Bridge, and off Bulls Stank Sewer, collected on 19th March 1864 at 8.10 p.m.	31·40	68·60	100·00	
42°	42°	South-east side of harbour of Leith, bank above Coalhill, collected on 23d March 1864 at 7.15 p.m.	47·72	52·28	100·00	
46°	45°	South-east side of harbour of Leith, 10 yards above Coalhill, collected on 21st March 1864 at 5.48 p.m.	21·92	78·08	100·00	
45°	45°	South-east side of harbour of Leith, 10 yards above Coalhill, collected on 29th March 1864 at 12.55 p.m.	52·50	47·50	100·00	0·84
36°	41°	South-east side of harbour of Leith, 3 yards in front of Coalhill, collected on 19th March 1864 at 7.52 a.m.	60·28	39·72	100·00	
42°	42°	South-east side of harbour of Leith, alongside Coalhill, collected on 23d March 1864 at 6.30 p.m.	27·72	72·28	100·00	
64°	56°	South-east side of harbour of Leith, between drawbridges, collected on 25th May 1864 at 11.40 a.m.	10·52	89·48	100·00	0·41
42°	42°	South-east side of harbour of Leith, below second drawbridge, collected on 23d March 1864 at 6.55 p.m.	10·36	89·64	100·00	0·43
64°	54°	South-east side of harbour of Leith, below second drawbridge, collected on 25th May 1864 at 12.15 p.m.	16·92	83·08	100·00	0·57
42°	42°	South-east side of harbour of Leith, off Ferry Boat Stairs, collected on 23d March 1864 at 7.0 p.m.	18·72	81·28	100·00	0·61
64°	52°	South-east side of harbour of Leith, at entrance to Prince of Wales Graving Dock, collected on 25th May 1864 at 12.30 p.m.	15·72	84·28	100·00	
60°	50°	South-east side of harbour of Leith, at entrance to Prince of Wales Graving Dock, collected on 28th May 1864 (Dredger) at 2.45 p.m.	26·20	73·80	100·00	0·58
		Average of 12 samples	28·33	71·67	100·00	0·64
36°	41°	North-west side of harbour of Leith, opposite Coalhill, collected on 19th March 1864 at 7.45 a.m.	25·32	74·68	100·00	
42°	42°	North-west side of harbour of Leith, at upper drawbridge, collected on 23d March 1864 at 6.25 p.m.	22·05	77·95	100·00	
42°	42°	North-west side of harbour of Leith, opposite Fishmarket, collected on 23d March 1864 at 6.40 p.m.	32·20	67·80	100·00	0·63
42°	42°	North-west side of harbour of Leith, below Second Drawbridge, collected on 23d March 1864 at 6.50 p.m.	16·84	83·16	100·00	
64°	54°	North-west side of harbour of Leith, at side of Custom-house, collected on 25th May 1864 at 11.35 a.m.	12·52	87·48	100·00	
64°	52°	North-west side of harbour of Leith, off bank at west side of Jetty Head, entrance to Victoria Dock, collected on 25th May 1864 at 12.10 p.m.	12·12	87·88	100·00	0·41
		Average of 6 samples	20·18	79·82	100·00	0·62

Table Q.

Gases evolved during the decomposition of the Sedimentary Matters lying in the Edinburgh Sewers and in the Bed of the Water of Leith.

Temperature of Sediment.	Places and Time of Collection.	Per-centage composition of the gases by volume.		
		Carbonic acid.	Oxygen.	Other gases.
Fahr. 45°	Gases evolved from sediment in Lochrin Burn, west of Slaughter-houses, collected on 14th April 1864	14·63	0·81	84·56, combustible with blue-white flame.
46°	Gases evolved from sediment in bed of Water of Leith at Coltbridge, collected on 14th April 1864	6·21	0·69	93·10 „ „
	Gases evolved from sediment in bed of Water of Leith at Coltbridge, collected on 30th May 1864 at 7 p.m.	12·00	1·20	86·80 „ „
47°	Gases evolved from sediment in bed of Water of Leith, behind Moray Place near St. Bernard's Well, collected on 14th April 1864	14·65	0·32	85·03 „ „
54°	Gases evolved from sediment in bed of Water of Leith, behind Moray Place near St. Bernard's Well, collected on 30th May 1864 at 6·35 p.m.	3·60	1·80	94·60 „ „
47°	Gases evolved from sediment in lade behind India Place, collected on 14th April 1864	1·56	1·56	96·88 „ „
54°	Gases evolved from sediment in lade behind India Place, collected on 30th May 1864 at 6·20 p.m.	1·60	1·40	97·00 „ „
54°	Gases evolved from sediment in bed of Water of Leith below Stockbridge, on 30th May 1864 at 6·5 p.m.	4·30	0·50	95·20 „ „
54°	Gases evolved from sediment in bed of Water of Leith, behind Warriston Crescent, collected on 30th May 1864 at 5·50 p.m.	4·90*	1·60	93·50 „ „
47°	Gases evolved from sediment in bed of Water of Leith, at St. Mark's Place, collected on 14th April 1864	3·63	2·17	94·20 „ „
54°	Gases evolved from sediment in bed of Water of Leith, at St. Mark's Place, collected on 30th May 1864 at 5·30 p.m.	4·80	1·90	93·30 „ „
54°	Gases evolved from sediment in bed of Water of Leith, at dam above Junction Road Bridge, collected on 30th May 1864 at 5 p.m.	9·50	1·40	89·10 „ „
55°	Gases evolved from sediment in bed of Harbour of Leith between Upper and Lower Drawbridges, collected on 30th May 1864 at 4·40 p.m.	25·60*	1·80	72·60 „ „
55°	Gases evolved from sediment in bed of Harbour of Leith off Jetty Head at entrance to Victoria Dock, collected on 30th May 1864 at 4·30 p.m.	7·70*	1·40	90·90 „ „
60°	Gases evolved from green slime collected at St. Mark's Place on 4th June at 9·30 a.m. and placed in inverted bottle. In three hours the gas which had been evolved was examined and found to consist of	13·40	1·60	85·00 „ „
60°	Gases evolved from green slime or matter collected at St. Mark's Place on 4th June at 9·30 a.m. and placed in bottle containing one-third of green slime, and the remaining two-thirds of common air. The atmosphere in forty hours extinguished a lighted taper and was found to consist of	11·56	2·01	86·43 not combustible and not capable of supporting combustion.

* Containing hydro-sulphuric acid in small quantities.

Table R.

Gases dissolved in the Water of the Water of Leith, &c.

Temperature of Matter.	Place and Time of Collection.	Cubic inches of gas per gallon of water.	Per-centage composition of the gases by volume.		
			Carbonic acid.	Oxygen.	Other gases.
44°	Spring water, as supplied to Edinburgh, taken from main leading into the cistern at Surgeons' Hall, on the 16th April 1864 at 10 a.m.	10·01	9·59	28·77	61·64
51°	Spring water, as supplied to Edinburgh, taken from the cistern at Surgeons' Hall after standing a night in the cistern, on 18th April 1864 at 10.5 a.m.	9·96	10·71	29·47	59·82
47°	Spring water, as supplied to Edinburgh, on 27th May 1864 at 3 p.m.	9·33	8·70	29·40	61·90
45°	Water from Harelaw Reservoir, taken on 15th April 1864 at 11 a.m.	9·24	1·92	29·23	68·85
46°	Water from Water of Leith, taken from above Balerno Bridge on 15th April 1864 at 12 noon	9·69	1·89	28·87	69·24
47°	Water from Water of Leith, taken from above Currie on 15th April 1864 at 12.35 p.m.	9·30	5·88	22·06	72·06
52°	Water from Water of Leith, taken from Gorgie Dam on 27th May 1864 at 12.45 p.m.	9·21	6·10	25·20	68·70
46°	Water from Water of Leith, taken above Coltbridge on 14th May 1864	9·60	7·41	22·22	70·37
53°	Water from Water of Leith taken from above Coltbridge on 27th May 1864 at 1 p.m.	9·29	6·60	22·20	71·20
45°	Water from Lochrin Burn, west of slaughter-houses, collected on 14th April 1864	13·71	52·67	3·33	44·00
59°	Water from Lochrin Burn, above Caledonian Distillery, collected on 27th May 1864 at 12.25 p.m.	9·77	50·00	2·70	47·30
59°	Water from Lochrin Burn above Coltbridge, collected on 27th May 1864 at 1.15 p.m.	12·67	54·70	2·10	43·20
52°	Water from Moray Place Sewer, collected on 27th May 1864 at 2.3 p.m.	10·74	42·30	2·80	54·90
50°	Water from sewer at Canonmills, collected on 27th May 1864 at 2.18 p.m.	13·87	59·60	2·60	37·80
53°	Water of Leith from dam below Water of Leith Village, collected on 27th May 1864 at 1.35 p.m.	6·31	6·30	4·20	89·50
53°	Water of Leith below Dean Bridge, collected on 27th May 1864 at 1.40 p.m.	7·22	14·30	5·70	80·00
47°	Water from Water of Leith, behind Moray Place, near St. Bernard's Well, collected on 14th April 1864	6·90	14·29	10·20	75·51
53°	Water from Water of Leith, behind Moray Place, near St. Bernard's Well, on 27th May 1864 at 1.50 p.m.	7·29	22·00	6·10	71·90
52°	Water from Water of Leith, above Stockbridge, collected on 27th May 1864 at 2.6 p.m.	6·05	19·70	6·60	73·70
52°	Water from Water of Leith, 30 yards below Stockbridge, collected on 27th May 1864 at 2.8 p.m.	5·60	24·60	4·10	71·30
47°	Water from Water of Leith at St. Mark's Place, collected on 14th April 1864	7·64	18·60	6·98	74·42
52°	Water from Water of Leith at St. Mark's Place, collected on 27th May 1864 at 2.30 p.m.	8·87	25·80	4·10	70·10
47°	Water from lade behind India Place, collected on 14th April 1864	6·47	9·52	4·76	85·72
53°	Water from lade behind India Place, collected on 27th May 1864 at 1.55 p.m.	7·13	12·80	6·40	80·80
53°	Water from lade before joining Water of Leith at St. Mark's Place, collected on 27th May 1864 at 2.35 p.m.	7·64	14·20	5·40	80·40

Table S.

Examination of the Atmosphere in the neighbourhood of the Water of Leith, &c. determined by standard solution of permanganate of potash.

Degree of absolute purity of air, 100°.

Place and Time of Collection.	Temperature of air.	Degree of purity.
Air collected at west side of St. Andrew's Square, Edinburgh, on 7th April 1864 at 6.35 p.m.	57°	85°
Air collected at the Scott Monument, Princes Street, Edinburgh, on 7th April 1864 at 6.25 p.m.	57°	70°
Air collected on the Calton Hill in Edinburgh on 7th April 1864 at 5.40 p.m.	57°	67°
Air collected over the Lochrin Burn Sewer west of slaughter-houses on 7th April 1864 at 1 p.m.	56°	55°
Air collected in the vicinity of the Canonmills Sewer in the Water of Leith on 7th April 1864 at 5 p.m.	55°	58°
Air collected over the Water of Leith above Coltbridge, and before mingling with sewage, on 7th April 1864 at 1.40 p.m.	56°	75°
Air collected over the Water of Leith below the dam under Water of Leith Village on 7th April 1864 at 2.10 p.m.	58°	(1) 100° destroyed. (2) 100° destroyed. (3) 100°, and only 20° left.
Air collected over the lade behind Moray Place on 7th April 1864 at 2.55 p.m.	56°	55°
Air collected over the Water of Leith at St. Mark's Place on 7th April 1864 at 5.15 p.m.	54°	63°
Air collected at west side of St. Andrew's Square, Edinburgh, on 9th April 1864 at 10.24 a.m.	59°	80°
Air collected on the Calton Hill, Edinburgh (S. of Observatory) on 9th April 1864 at 10.34 a.m.	63°	75°
Air collected in Windsor Street, Edinburgh, on 9th April 1864 at 10.43 a.m.	64°	80°
Air collected at the south-west corners of Constitution and Charlotte Streets, Leith, on 9th April 1864 at 1.20 p.m.	64°	80°
Air collected in harbour of Leith at Victoria Dock Head on 9th April 1864 at 2.50 p.m.	59°	76°
Air collected in harbour of Leith off Ferry Boat Stairs on 9th April 1864 at 3 p.m.	61°	60°
Air collected at foot of Fishmarket Stairs, harbour of Leith, on 9th April 1864 at 11.10 a.m.	59°	60°
Air collected off side of vessel near Coalhill Sewer, Leith, on 9th April 1864 at 11.25 a.m.	63°	50°
Air collected over the Water of Leith, midway between Coalhill and Bulls Stank Sewers on 9th April 1864 at 2.40 p.m.	64°	60°
Air collected at east side of Junction Road Bridge over Water of Leith on 9th April 1864 at 11.33 a.m.	66°	60°
Air collected in the vicinity of the Broughton Burn, near Leith, on 9th April 1864 at 12.15 p.m.	65°	55°
Air collected over the Water of Leith at St. Mark's Place, Edinburgh, on 9th April 1864 at 3.35 p.m.	62°	55
Air collected in the vicinity of the North Sewer at Stockbridge, Edinburgh, on 9th April 1864 at 4 p.m.	56°	55°
Air collected over the lade behind India Place, Edinburgh, on 9th April 1864 at 4.10 p.m.	61°	60°
Air collected under dam below Water of Leith Village, Edinburgh, on 9th April 1864 at 4.30 p.m.	68°	50°
Air collected under dam above Water of Leith Village. Edinburgh, on 9th April 1864 at 4.40 p.m.	61°	55°
Air collected over the Lochrin Burn, west of slaughter-houses, on 14th April 1864 at 11.20 a.m.	60°	68°
Air collected over Water of Leith above Coltbridge, and before mingling with sewage, on 14th April 1864 at 12.20 p.m.	60°	80°
Air collected over Water of Leith behind Moray Place, Edinburgh, on 14th April 1864 at 1 p.m.	63°	68°
Air collected over Water of Leith behind India Place, Edinburgh, on 14th April 1864 at 1.40 p.m.	68°	70°
Air collected in the vicinity of the North Sewer at Stockbridge, Edinburgh, on 14th April 1864 at 1.50 p.m.	62°	64°
Air collected over the Water of Leith at St. Mark's Place, Edinburgh, on 14th April 1864 at 2.30 p.m.	64°	70°

Table T.

Organic growths found in the open sewers and in the Water of Leith conveying sewage.

Dried at 212° Fahrenheit.

Place and Time of Collection.	Per-centage composition.			
	Organic matter.	Earthy matter.	Total.	Nitrogen.
Edinburgh sewers, organic growth collected from Lochrin Burn, west of slaughter-houses, on 23d March 1864 at 1.5 p.m.	64·32	35·68	100·00	0·96
Edinburgh sewers, organic growth collected from Lochrin Burn, west of slaughter-houses, on 20th May 1864 at 12.40 p.m.	40·52	59·48	100·00	0·68
Water of Leith lade, organic growth collected from twigs of trees hanging into the lade behind Moray Place on 23d March 1864 at 3 p.m.	34·60	65·40	100·00	0·52
Water of Leith lade, organic growth collected from the stones of the sides of the lade behind Moray Place on 23d March 1864 at 3.10 p.m.	38·84	61·16	100·00	0·56
Water of Leith lade, organic growth collected from the stones of the sides of the lade behind Moray and Ainslie Place on 28th May 1864 at 2.15 p.m.	57·87	42·13	100·00	1·42
Bed of Water of Leith, organic growth collected off stones in bed of river behind Moray and Ainslie Places on 11th April 1864 at 11.30 a.m.	66·00	34·00	100·00	0·79
Bed of Water of Leith, organic growth collected off sides of run of Water of Leith, 30 yards below Stockbridge, on 20th May 1864 at 2.40 p.m.	52·12	47·88	100·00	0·92
Average of 7 samples	50·61	49·39	100·00	0·84

Table U.

Average Analyses.

Liquids collected from the Drains and Sewers discharging into the Water of Leith. One Imperial Gallon contains

Place of Collection.	In solution.			In suspension.			In solution and suspension.		
	Organic matter in grains.	Saline matter in grains.	Total matter in solution grains.	Organic matter in grains.	Earthy matter in grains.	Total matter in suspension in grains.	Organic matter in grains.	Saline and earthy matter in grains.	Grand total matter in grains.
Average of 18 samples from Lochrin Burn sewer, west of abbatoir or slaughter-houses	12·36	26·61	38·97	33·06	24·66	57·72	45·42	51·27	96·69
Average of 15 samples from Lochrin Burn sewer, above Caledonian Distillery	15·77	26·70	42·47	28·61	7·79	36·40	44·38	34·49	78·87
Average of 20 samples from Lochrin Burn sewer, above Coltbridge and just before entering the Water of Leith, west of Edinburgh	31·31	26·53	57·84	29·23	9·17	38·40	60·54	35·70	96·24
Average of 10 samples from North sewer at Stockbridge, Edinburgh	8·29	24·04	32·33	13·27	8·81	22·08	21·56	32·85	54·41
Average of 12 samples from South (Moray Place) sewer at Stockbridge	7·07	22·45	29·52	24·72	12·45	37·17	31·79	34·90	66·69
Average of 21 samples from Canonmills sewer	8·20	24·10	32·30	15·50	11·00	26·50	23·70	35·10	58·80
Average of 2 samples from Broughton Burn sewer at Bonnington Road	10·56	25·52	36·08	37·44	17·20	54·64	48·00	42·72	90·72
Average of 5 samples from Bulls Stank sewer	5·92	31·42	37·34	10·88	5·28	16·16	16·80	36·70	53·50
Average of 3 samples from Coal Hill sewer at Leith	64·64	145·76	210·40	80·48	36·32	116·80	145·12	182·08	327·20
Average of 1 sample from sewer below lower drawbridge at Leith	7·84	46·56	54·40	10·40	4·80	15·20	18·24	51·36	69·60

Table V.

Average Analyses.

Liquids collected from the Water of Leith, from immediately above Coltbridge down to the Harbour of Leith. One Imperial Gallon contains

Place of Collection.	In solution.			In suspension.			In solution and suspension.		
	Organic matter in grains.	Saline matter in grains.	Total matter in solution in grains.	Organic matter in grains.	Earthy matter in grains.	Total matter in suspension in grains.	Organic matter in grains.	Saline and earthy matter in grains.	Grand total matter in grains.
Average of 23 samples from the Water of Leith immediately above Coltbridge	3·34	12·96	16·30	1·73	2·32	4·05	5·07	15·28	20·35
Average of 1 sample from the Water of Leith at dam below Coltbridge	6·40	16·80	23·20	2·96	1·32	4·28	9·36	18·12	27·48
Average of 2 samples from the Water of Leith at dam above Water of Leith Village	4·60	11·84	16·44	5·59	3·04	8·63	10·19	14·88	25·07
Average of 8 samples from the Water of Leith at dam below Water of Leith Village	5·36	14·93	20·29	4·27	1·38	5·65	9·63	16·31	25·94
Average of 6 samples from the Water of Leith under Dean Bridge	7·39	15·73	23·12	2·76	0·69	3·45	10·15	16·42	26·57
Average of 6 samples from the Water of Leith behind Moray Place, near St. Bernard's Well	6·86	15·08	21·94	2·75	0·70	3·45	9·61	15·78	25·39
Average of 6 samples from the Water of Leith above Stockbridge	7·36	16·16	23·52	2·55	0·58	3·13	9·91	16·74	26·65
Average of 9 samples from the Water of Leith, 30 yards below Stockbridge	8·92	15·40	24·32	14·24	2·50	16·74	23·16	17·90	41·06
Average of 1 sample from the Water of Leith behind Warriston Crescent	7·04	25·60	32·64	10·68	3·52	14·20	17·72	29·12	46·84
Average of 6 samples from the Water of Leith lade behind India Place	6·05	17·14	23·19	2·84	1·06	3·90	8·89	18·20	27·09
Average of 2 samples from the Water of Leith lade below Beaver Hall	10·20	17·28	27·48	6·02	1·36	7·38	16·22	18·64	34·86
Average of 18 samples from the Water of Leith at St. Mark's Place below junction of lade	7·98	14·68	22·66	18·47	15·27	33·73	26·45	29·95	56·39
Average of 1 sample from the Water of Leith from dam above Bonnington	12·80	17·80	30·60	115·68	153·12	268·80	128·48	170·92	299·40
Average of 1 sample from the Water of Leith at boundary of Edinburgh and Leith at Bonnington Bridge	10·24	17·60	27·84	30·88	33·12	64·00	41·12	50·72	91·84
Average of 1 sample from the Water of Leith from dam above Junction Road Bridge	16·96	21·92	38·88	500·96	369·12	870·08	517·92	391·04	908·96
Average of 1 sample from the Water of Leith above the Saw Mills at Leith	4·32	10·08	14·40	5·20	3·52	8·72	9·52	13·60	23·12
Average of 2 samples from the Water of Leith below Junction Road Bridge	9·18	18·32	27·50	3·72	3·28	7·00	12·90	21·60	34·50
Average of 3 samples from the Water of Leith above Coal Hill at Leith	9·01	65·60	74·61	14·29	5·92	20·21	23·30	71·52	94·82
Average of 1 sample from the Water of Leith from off Coal Hill Sewer at Leith	35·20	170·08	205·28	8·32	6·72	15·04	43·52	176·80	220·32
Average of 1 sample from the Water of Leith from harbour at Upper Drawbridge	27·36	157·76	185·12	4·16	3·84	8·00	31·52	161·60	193·12
Average of 1 sample from the Water of Leith from harbour below Upper Drawbridge	31·84	609·60	641·44	10·72	10·40	21·12	42·56	620·00	662·56
Average of 1 sample from the Water of Leith from harbour off Victoria Dockhead	3·92	1208·80	1212·72	1·32	1·12	2·44	5·24	1209·92	1215·1

Table W.

Average Analyses.

Sedimentary Matters collected from the open Sewers discharging into the Water of Leith, from the bed of the Water of Leith, and from the bottom of the Edinburgh lade.

Dried at 212° Fahr.

Place of Collection.	Per-centage composition.			
	Organic matter.	Earthy matter.	Total.	Nitrogen.
Average of 7 samples collected from Edinburgh sewers, Lochrin Burn sewer, west of abbatoir or slaughter-houses	49·70	50·30	100·00	1·27
Average of 3 samples collected from Edinburgh sewers, Lochrin Burn sewer, above Caledonian Distillery	27·70	72·30	100·00	0·52
Average of 3 samples collected from Edinburgh sewers, Lochrin Burn sewer, immediately above Coltbridge	17·02	82·98	100·00	0·71
Average of 1 sample collected from Edinburgh sewers, Bulls Stank sewer, at Lovers Loan	50·72	49·28	100·00	0·76
Average of 1 sample collected from Edinburgh sewers, Broughton Burn sewer, at Bonnington Road	20·52	79·48	100·00	0·82
Average of 4 samples collected from bed of Water of Leith, between Water of Leith Village and the Dean Bridge	48·12	51·88	100·00	1·63
Average of 2 samples collected from bed of Water of Leith, behind Ainslie and Moray Places	44·92	55·08	100·00	0·98
Average of 8 samples collected from bed of Water of Leith, below North and South sewers at Stockbridge	43·67	56·33	100·00	1·14
Average of 1 sample collected from bed of Water of Leith, from sides of narrowed channel at Stockbridge	34·52	65·48	100·00	0·50
Average of 1 sample collected from bed of Water of Leith, 80 yards below Stockbridge	25·12	74·88	100·00	1·08
Average of 1 sample collected from bed of Water of Leith, behind Malta Terrace	32·52	67·48	100·00	1·08
Average of 1 sample collected from bed of Water of Leith, in front of sewer at Canonmills	31·72	68·28	100·00	0·57
Average of 9 samples collected from bed of Water of Leith, behind Warriston Crescent and at St. Mark's Place	36·05	63·95	100·00	1·05
Average of 1 sample collected from bed of Water of Leith at dam above Bonnington	49·72	50·28	100·00	1·40
Average of 1 sample collected from bed of Water of Leith at boundary of Edinburgh and Leith at Bonnington Bridge	26·92	73·08	100·00	0·70
Average of 1 sample collected from bed of Water of Leith, immediately below the junction of the Broughton Burn	13·72	86·28	100·00	0·52
Average of 1 sample collected from bed of Water of Leith, at dam above Junction Road Bridge	27·72	72·28	100·00	0·70
Average of 7 samples collected from bed of Water of Leith lade which traverses Edinburgh	25·70	74·30	100·00	0·69
Average of 12 samples collected from the bottom of the harbour of Leith, south-east side	28·33	71·67	100·00	0·64
Average of 6 samples collected from the bottom of the harbour of Leith, north-west side	20·18	79·82	100·00	0·62

Table X.

Average Analyses.

Gases evolved during the decomposition of the Sedimentary Matters lying in the open Sewers, the Lades, and in the Bed of the Water of Leith.

Place of Collection.	Per-centage composition of the gases by volume.		
	Carbonic acid.	Oxygen.	Other gases.
Average of 1 sample of gases evolved from sediment in Lochrin Burn	14·63	0·81	84·56, combustible with blue white flame.
Average of 4 samples of gases evolved from sediment in bed of Water of Leith from Coltbridge down to St. Bernard's Well	9·12	1·00	89·88 „ „
Average of 2 samples of gases evolved from sediment in lade of Water of Leith which traverses Edinburgh	1·58	1·48	96·94 „ „
Average of 5 samples of gases evolved from sediment in bed of Water of Leith, from Stockbridge down to Junction Road Bridge	5·43*	1·51	93·06 „ „
Average of 2 samples of gases evolved from sediment in Harbour of Leith	16·65*	1·60	81·75 „ „

* Containing hydrosulphuric acid (sulphuretted hydrogen).

Table Y.

Average Analyses.

Gases dissolved in the Water of the Water of Leith, &c.

Place of Collection.	Cubic inches of gas per gallon of water.	Per-centage composition of the gases by volume.		
		Carbonic acid.	Oxygen.	Other gases.
Average of 3 samples of spring-water as supplied to Edinburgh	9·77	9·67	29·21	61·12
Average of 2 samples of water from the sources of the Water of Leith	9·47	1·91	29·05	69·04
Average of 4 samples of water from the Water of Leith as it flows down to Coltbridge	9·35	6·50	22·92	70·58
Average of 5 samples of water from the sewers of Edinburgh	12·15	51·85	2·71	45·44
Average of 8 samples of water from the Water of Leith, from Coltbridge down to St. Mark's Place	7·10	18·20	6·00	75·80
Average of 3 samples of water from the lade of the Water of Leith which traverses Edinburgh	7·08	12·17	5·52	82·31

Table Z.

Average Analyses.

Examination of the Atmosphere in the Neighbourhood of the Water of Leith, &c.

Degree of absolute Purity of Air, 100°·00.

Place of Collection.	Degree of Purity.
Average of 7 samples of air collected from five stations in Edinburgh and Leith away from the influence of open sewers and of the Water of Leith	76°·71
Average of 2 samples of air collected over the Water of Leith above Coltbridge and before mingling with sewage	77°·50
Average of 3 samples of air collected from above the open sewers of Edinburgh and Leith	59°·33
Average of 16 samples of air collected over the Water of Leith from Coltbridge down to the Harbour of Leith, and after being mingled with sewage*	60°·37
Average of 2 samples of air collected over the lade of the Water of Leith which traverses Edinburgh and conveys sewage	57°·50

* One sample of air collected over the Water of Leith, below the dam under Water of Leith Village, has not been included in the above average, as its degree of impurity is unusually high (Table S.) owing to the more rapid escape of the impure gases from the water as it falls over the dam and is dashed into foam.

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Plan of EDINBURGH LEITH AND SUBURBS

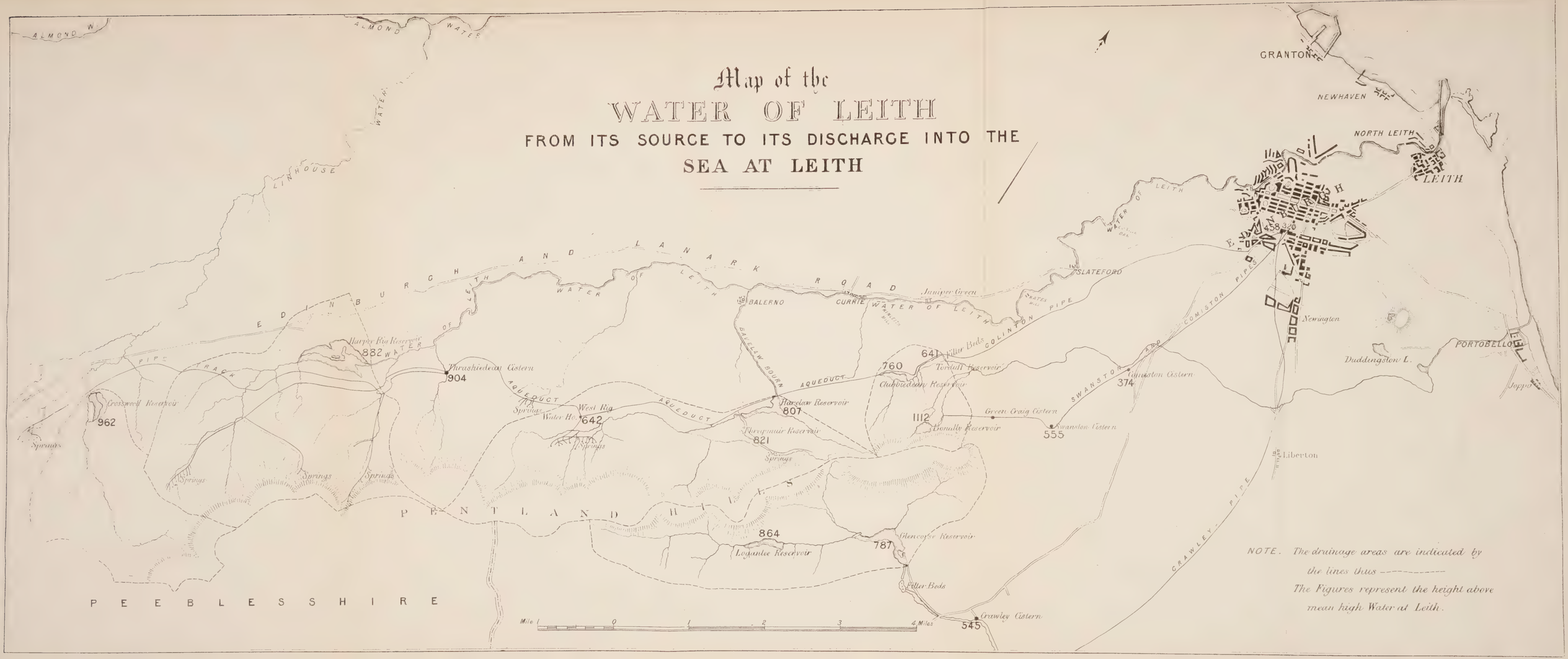
ILLUSTRATIVE OF THE MAIN DRAINAGE SCHEME FOR THE PURIFICATION OF THE WATER OF LEITH.

The areas draining into the Water of Leith are edged with Green.
The Main Sewer and its branches are shewn by a Thick Red Line.
The Ordinary Street Drains and Sewers to be intercepted, are shewn by a Thin Red Line.
The Water of Leith, and the principal Lade and the open Burns conveying Sewage are coloured Blue.

N.B.—Between Coltbridge and St Mark's Place the Main Drain lies in the Water of Leith, near the South East Bank.

Dicy & Son (Limited) Lith.

Map of the
WATER OF LEITH
FROM ITS SOURCE TO ITS DISCHARGE INTO THE SEA AT LEITH


ALMOND WATER
LINHOUSE
EDINBURGH AND LANARK ROAD
WATER OF LEITH
PENTLAND HILLS
PEEBLESSHIRE
Harpley Rig Reservoir
882
Crosswood Reservoir
962
Springs
Threshiedean Cistern
904
Springs
West Rig
642
Water House
Springs
Springs
Springs

REFORM CLUB
PALL MALL